

Part 3: Service manual, class 271 - 275

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**IMPORTANT**

The illustrations in this manual are of various classes or sub-classes of the special sewing machine.

Please remember that your special sewing machine may differ from the machine illustrated.



1. General

This service manual describes the adjustment of the special sewing machine, classes **271 to 275**.

- 271** single-needle double-lockstitch machine with skipping underfeed
- 272** single-needle double-lockstitch machine with skipping underfeed and needle feed
- 273** single-needle double-lockstitch machine with skipping underfeed and intermittent roller overfeed
- 274** single-needle double-lockstitch machine with skipping underfeed, needle feed and intermittent roller overfeed.
- 275** single-needle double-lockstitch machine with skipping underfeed and differential foot overfeed



IMPORTANT

The processes described in this manual may only be carried out by specialist personnel or persons with appropriate training.



Caution: danger of injury

Before all repair, conversion and maintenance work turn off the main switch and isolate the machine from the pneumatic supply.

When carrying out adjustment work and function-testing with the machine running, comply with all safety measures and take the utmost care.

This service manual describes the adjustment of the sewing machine in a logical order. It must be borne in mind that various adjustments are mutually dependent. The adjustment process must therefore be carried out in the order given.

For all adjustments of stitch-forming components a flawless new needle must be fitted.

When adjusting cutting devices the tools must be replaced.

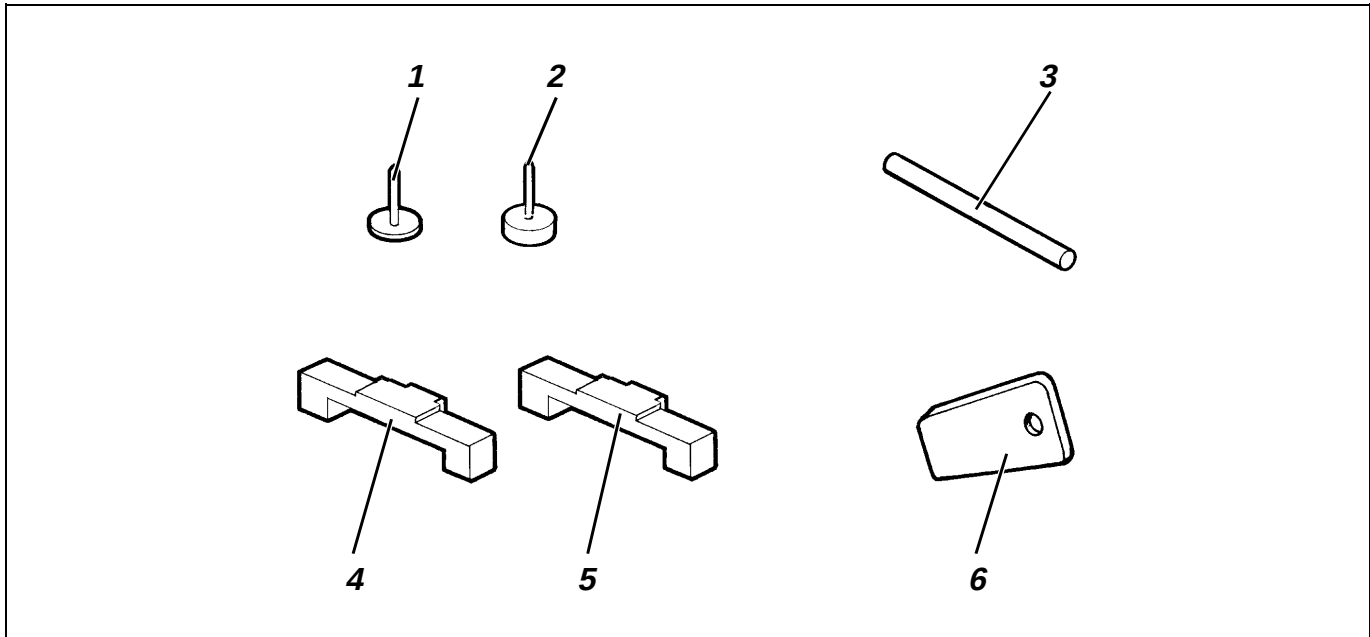


IMPORTANT

All colour-marked components are factory-set. These settings should not be altered except by specialists.



1.1 Gauges

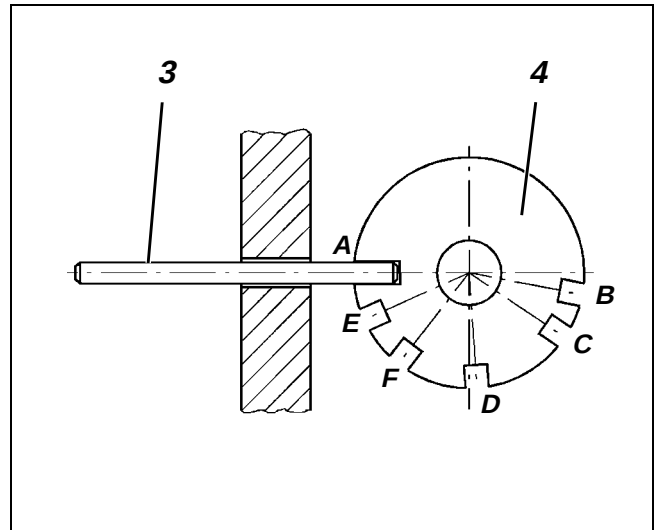


With the adjustment gauges listed below the sewing machine can be precisely adjusted and tested.

item	gauge	order no.	use
1	gauge	0216 001069	needle-bar height class 271/273
2	gauge	0272 001240	needle-bar height class 272/274
3	adjusting pin	9301 022608	lock sewing machine in positions A - F
4	gauge	0271 000767	needle-bar height and shuttle-drive housing with small shuttle (0271 000751 / 0271 001991)
5	gauge	0271 000766	needle-bar height and shuttle-drive housing with large shuttle (0271 001021 / 0271 002041)
6	gauge	Z124 000443	adjusting edge cutter class 272



1.2 Description and adjustment of the integral adjusting disc



The sewing machine can be locked in all adjustment positions with locking pin 3 and the integral adjusting disc 4 on the synchronous-belt pulley of the arm shaft.

The adjusting disc has 6 notches which are marked on the handwheel by the letters **A, B, C, D, E** and **F**. In conjunction with marking 2 the letters indicate the position of the notches in which the machine can be locked with pin 3.

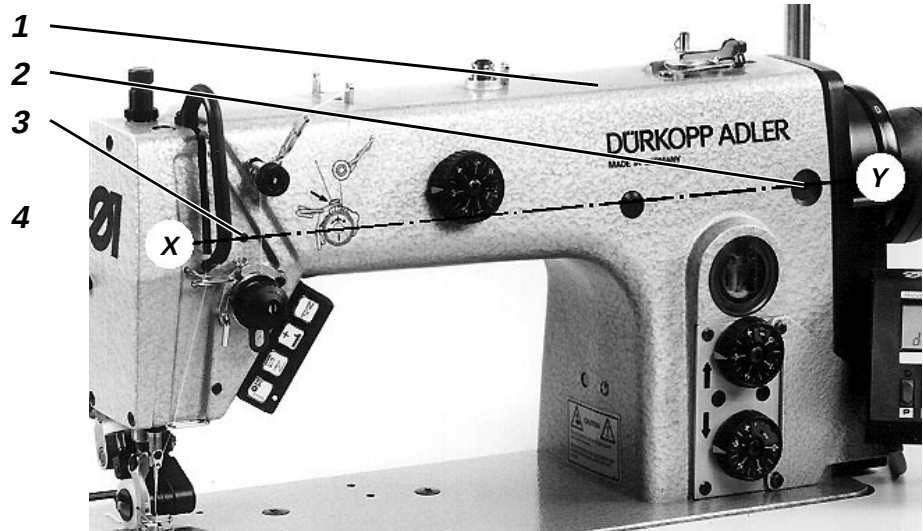
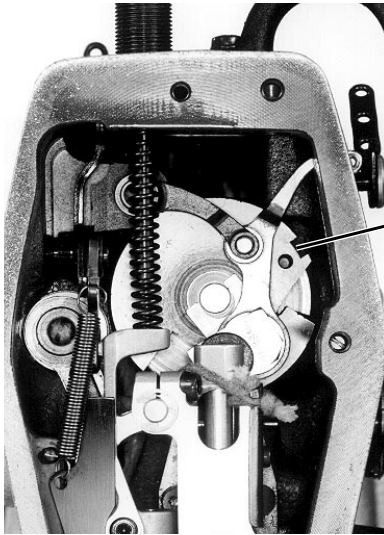
Notch **A** (loop-lift position) is deeper than the other notches.

The following items should be adjusted in the various positions:

- A** adjusting disc with respect to the groove in the arm-shaft crank, parallelism, belt wheel, loop lift, distance of shuttle beak from needle
- B** feed-dog standstill when stitch-length regulator moves, **classes 271 + 273** (feed-dog TDC)
foot-overfeed standstill when upper regulator moves (**class 275**).
- C** 2nd needle position
- D** control cam for thread clipper
- E** needle-bar height,
feed-dog standstill when stitch-length regulator moves, **classes 272 + 274** (feed dog TDC).
lift cam, **class 275**.
- F** 1st needle position



1.3 Positioning the integral adjusting disc with respect to the arm shaft



IMPORTANT

Adjustments carried out with the adjusting disc will only be correct if the disc itself has been adjusted as described below. If the arm shaft is moved, all subsequent settings must be checked and adjusted if necessary.



Caution: danger of injury

Turn off the main switch.
The position of the arm shaft may only be adjusted with the sewing machine switched off.

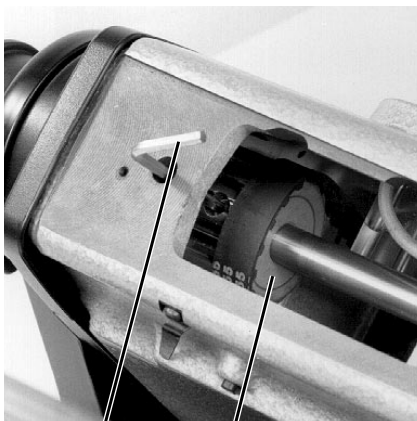
Regulation and inspection

The groove 4 and notch A of the adjusting disc on the synchronous-belt pulley must coincide on the X - Y line.

- Lock the arm shaft with a locking pin or a 5 mm Ø pin in the arm-shaft groove 4 (through hole 3).
- It must be possible to pass the locking pin through the hole 2 in position A into the integral adjusting disc.

Adjustment

- Remove bobbin-winder cover 1.
- Undo the screws of synchronous-belt pulley 6 from above with the Allen key 5 through the hole.
- Lock the synchronous-belt pulley in position A with the locking pin.
- Insert a 5 mm-thick pin into the rig hole 3 and allow it to engage in the arm-shaft groove 4.
- Tighten the screws on the synchronous-belt pulley 6. The synchronous-belt pulley must not be axially shifted.



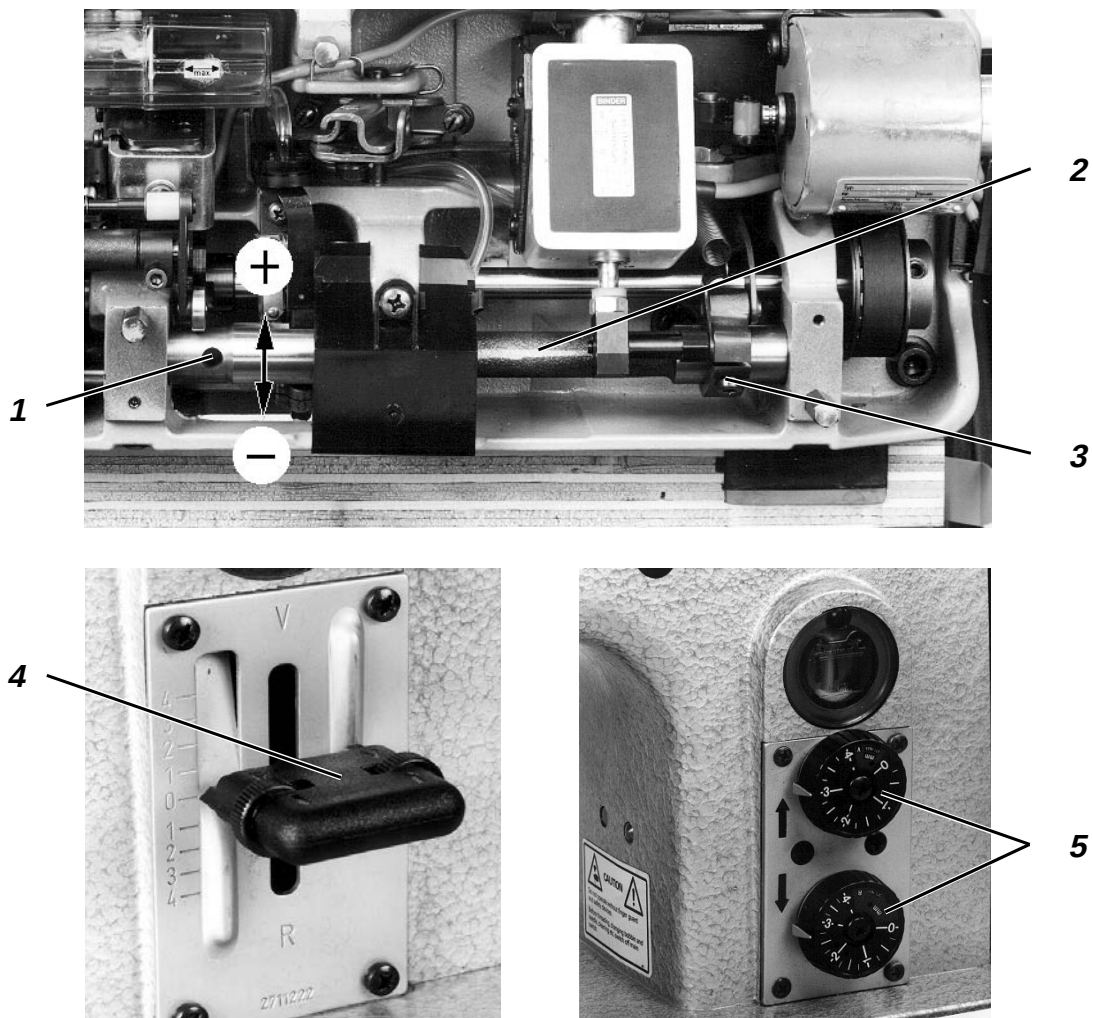
5

6



2. Null point, feed with fitments

2.1 Null-point adjustment (position of stitch-length regulator)



Regulation and inspection

With the stitch-length lever 4 or the adjusting wheels 5 in their null positions the feed dog and needle must not move when the handwheel is turned.



Caution: danger of injury

Turn off the main switch.
The feed null-position must only be adjusted with the machine switched off.

Adjustment

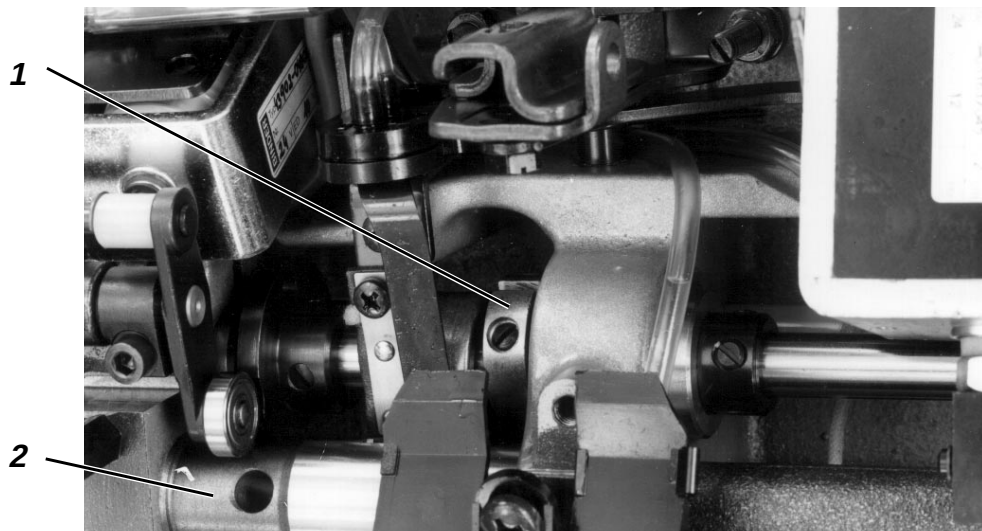
- Set the stitch-length lever 4 or adjusting wheels 5 to "0".
 - Undo screw 3.
 - Insert screwdriver into hole 1.
 - Rotate guide 2.
- The feed must not operate when the handwheel is turned.

To increase the forward feed: turn in the + arrow direction
To decrease the forward feed: turn in the - arrow direction

- Retighten screw 3.



2.2 Feed halt when the stitch-length regulator (thrust cam) moves



Regulation and inspection

With the sewing machine locked in position **B (class 271/273/275)** or position **E (class 272/274)** and the stitch length at maximum, there must be no feed movement when the stitch-length regulator 2 is moved.



Caution: danger of injury

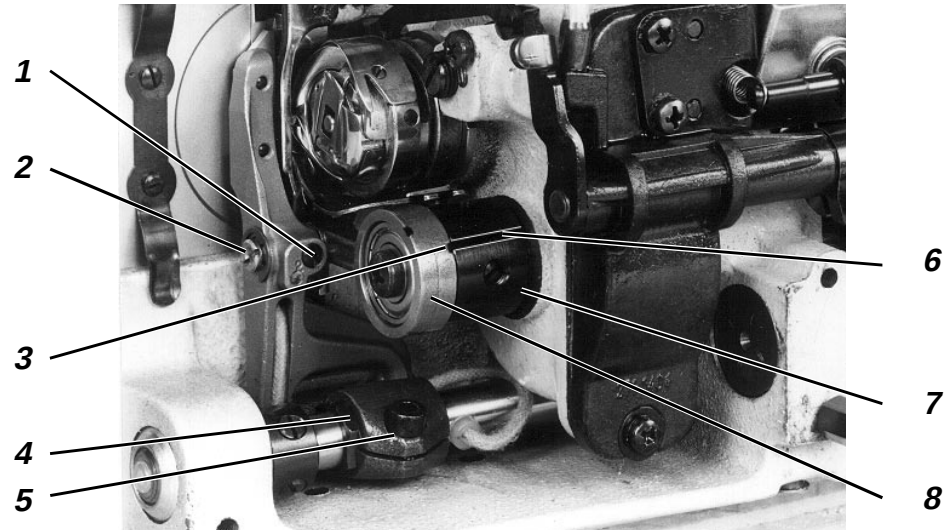
Turn off the main switch.

The feed standstill may only be adjusted with the sewing machine switched off.

Adjustment

- Set the stitch length to maximum.
- Undo both screws of thrust cam 1.
- Lock sewing machine:
class 271/273/275 in position **B**
class 272/274 in position **E**.
- Rotate thrust cam 1.
When the stitch-length regulator 2 is moved the feed dog must remain at a halt.
- Retighten both screws of thrust cam 1.
This must place the thrust cam 1 hard up against the bearing (axial shaft position).

2.3 Hub cam and feed-dog height



Regulation and inspection

With the sewing machine locked in position **B** (class 271/273/275) or position **E** (class 272/274) markings 3 and 6 of the lift cam 7 and the connecting rod 8 must be in line.

In its highest position the feed dog should protrude by 0.9 or 1.1 mm in the region of the needle hole:

0.9 mm with a fine-toothed feed dog
1.1 mm with a coarse-toothed feed dog.



Caution: danger of injury

Turn off the main switch.

The lift cam and feed-dog height may only be adjusted with the sewing machine turned off.

Lift-cam adjustment

- Undo both screws of the lift cam 7.
- Lock the sewing machine:
class 271/273/275: in position **B**
class 272/274: in position **E**.
- Rotate lift cam 7.
The markings 3 and 6 must be in line.
- Retighten both screws of lift cam 7.

Feed-dog height adjustment

- Lock the sewing machine:
class 271/273/275: in position **B**
class 272/274: in position **E**.
- Undo screw 1.
- Rotate eccentric bolt 2.
In its highest position the feed dog should protrude by 0.9 or 1.1 mm in the region of the needle hole:

0.9 mm with a fine-toothed feed dog
1.1 mm with a coarse-toothed feed dog.

The position of the eccentric bolt 2 depends on the adjustment of eccentric bush 4 in the advance lever 5. See section 2.3.1.

- Retighten screw 1.

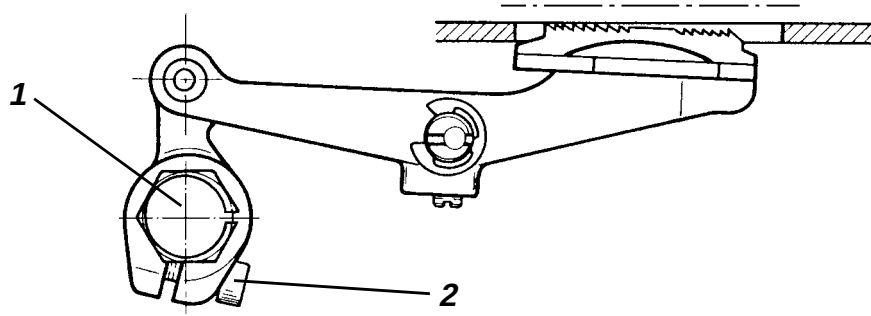


Fig.: A

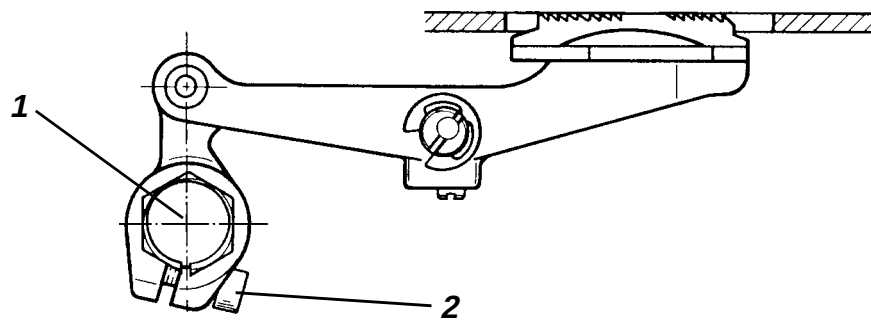


Fig.: B

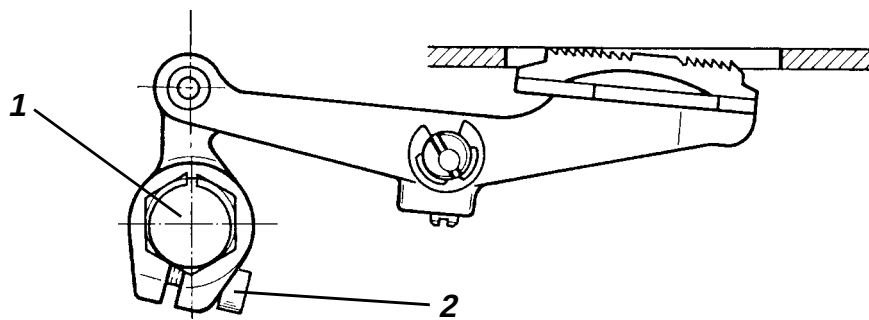


Fig.: C

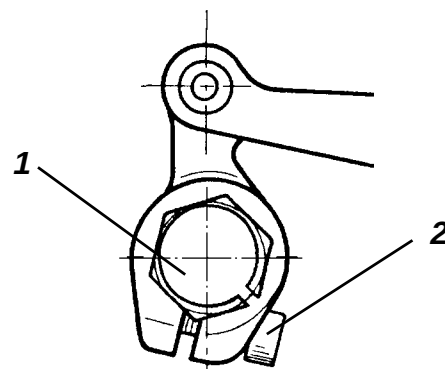


Fig.: D



2.3.1 Eccentric bush

Regulation and inspection

Class 271/273/275

The eccentric bush 1 is adjusted at the factory so that at **TDC** the feed dog is parallel to the needle-plate surface. In the basic position the slit is horizontal (**Fig. A**).

When the feed dog emerges from the needle plate its back end emerges first.

When the slit of the eccentric bush is in the **down** position (**Fig. B**), the feed dog emerges from the needle plate in parallel. This avoids stretching the material. This is particularly important with stretch material or material which is inelastic in the warp and weft directions but which stretches when sewn in the diagonal direction.

When the slit of the eccentric bush is in the **up** position, the feed dog is at a greater angle (**Fig. C**) when it emerges from the needle plate. This angled emergence improves "smooth sewing" with inelastic material such as poplin and certain lining materials. If necessary the eccentric bush can also be placed in intermediate positions.

Class 272/274

The eccentric bush 1 is adjusted at the factory so that at **TDC** the feed dog has a slightly rearwards slope. In the basic position the slit is at an angle of 45° to the horizontal (**Fig. D**).



IMPORTANT

If the eccentric bush has been altered, the feed-dog height must be re-adjusted (see section 2.3).



Caution: danger of injury

Turn off the main switch.

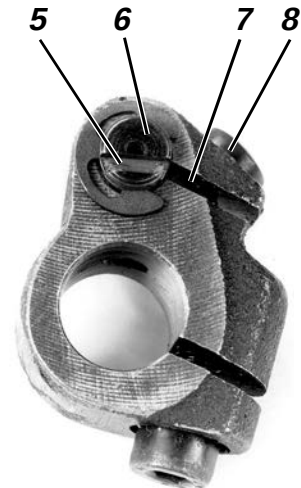
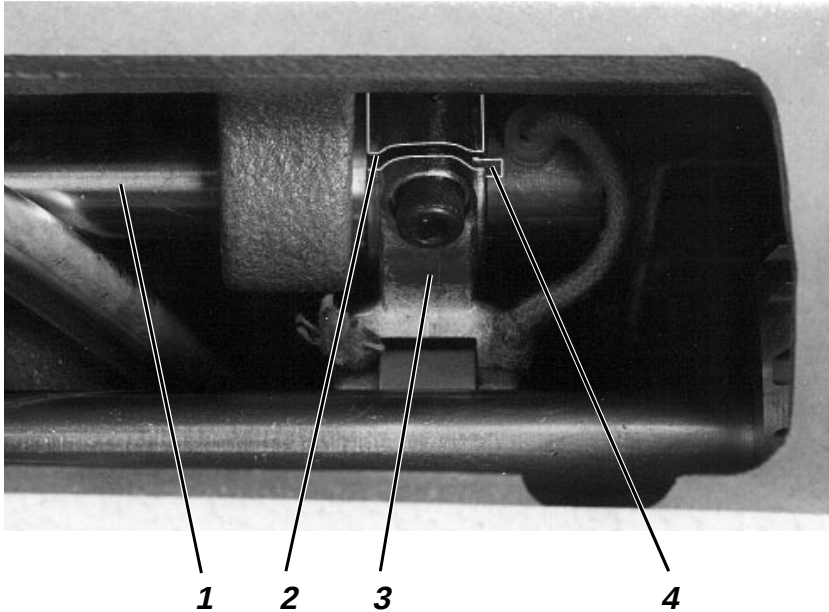
The eccentric bush may only be adjusted with the sewing machine switched off.

Adjustment

- Undo screw 2.
- Adjust eccentric bush 1.
- Retighten screw 2.



2.4 Class 272/274: synchronisation of needle feed and underfeed



Regulation and inspection

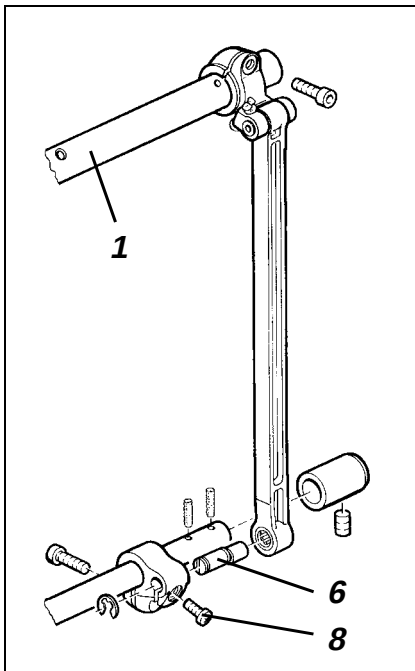
The needle feed and underfeed are factory-set to be equal.

- Set stitch length to maximum.
- Check synchronisation by turning the handwheel.



Caution: danger of injury

Turn off the main switch.
The needle feed and underfeed may only be adjusted with the sewing machine switched off.



Adjustment

- Remove bobbin-winder cover.
- Check that groove 4 of shaft 1 and slit 2 of block 3 are in line. If not, turn shaft 1 until they are.
- Undo locking screw 8.
- Turn eccentric bolt 6.
Groove 5 and slit 7 must be in the position shown in the illustration. The synchronisation of needle feed and underfeed is set.
- Retighten locking screw 8.

With feed-critical material, in order to reduce any displacement of the fabric layers which may occur, the needle feed can be set up to some 15% greater than the underfeed by turning eccentric bolt 6. Turning it by 180° produces the maximum adjustment. The distance between the needle bar and pressure bar remains at 9 mm during this adjustment.

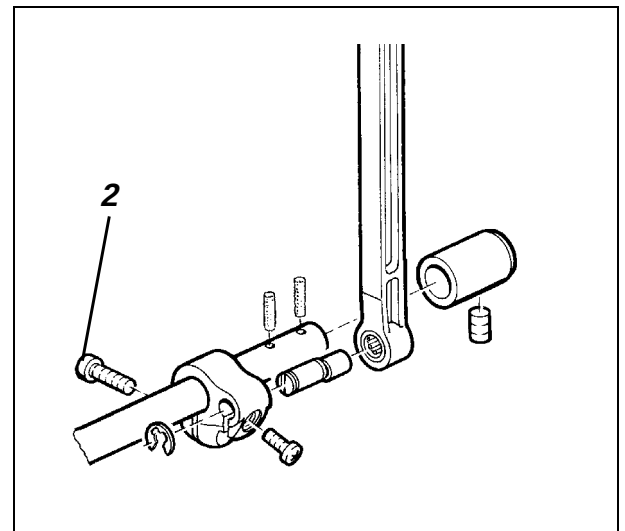
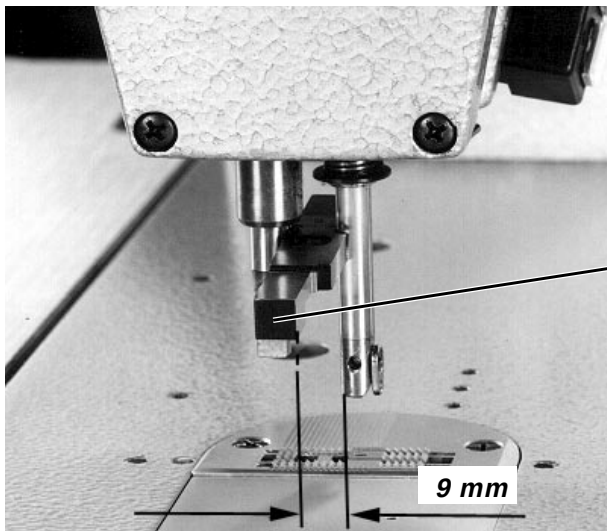
If the eccentric bolt is adjusted by less than this, the distance between the needle bar and pressure bar must be re-adjusted.



IMPORTANT

When the needle feed is increased the needle must not touch the sides of the needle hole in the feed dog.

2.5 Class 272/274: distance between needle bar and pressure bar



Regulation and inspection

When the stitch regulator is at "0", the distance between the needle bar and pressure bar should be 9 mm.



Caution: danger of injury

Turn off the main switch.
The distance may only be adjusted with the sewing machine switched off.

Adjustment

- Set the stitch regulator to " 0 ".
- Undo locking screw 2.
- Swivel the needle-bar guide.
Use gauge 1 to adjust the distance between the needle bar and pressure bar to 9 mm.

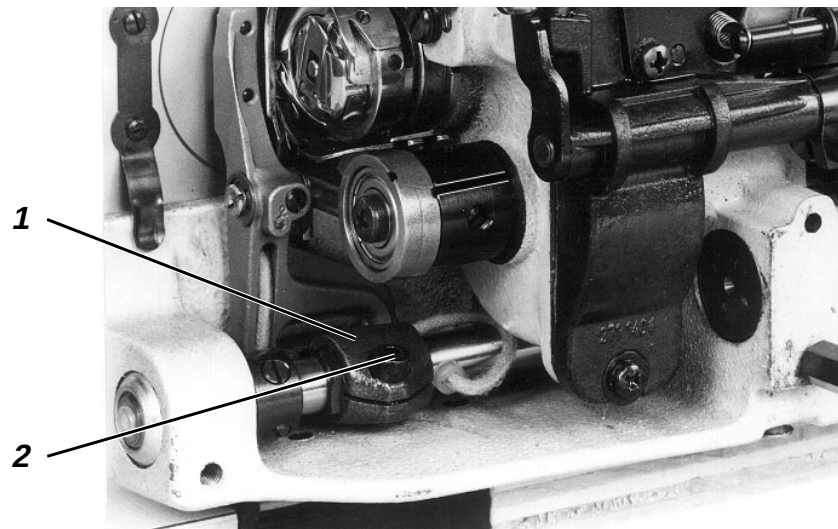
gauge 1

order no.: 0271 000767

- Tighten locking screw 2.



2.6 Class 272/274: aligning the feed dog



Regulation and inspection

The needle should enter the centre of the feed-dog needle hole if the distance between the needle bar and pressure bar is correctly set to 9 mm.



Caution: danger of injury

Turn off the main switch.

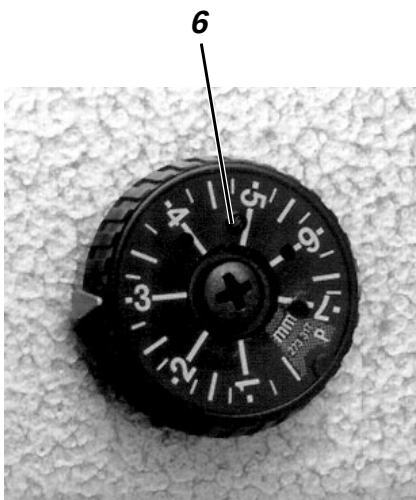
The feed dog may only be adjusted with the sewing machine switched off.

Adjustment

- Undo locking screw 2 of the advance lever 1.
- Align feed dog.
The needle should enter the centre of the feed-dog needle hole.
The distance between the feed dog and the needle plate should be equally large at each side.
- Retighten locking screw 2.



2.7 Class 273/274: roller overfeed



Regulation and inspection

The feed roller 3 is automatically lifted when the sewing foot is raised and for bar-tacking.

This function must be entered in control field 5.
See setting-up instructions, section 12.

The maximum feed length of the intermittent roller overfeed is 7 mm.
The feed length can be adjusted independently of the underfeed with adjusting wheel 4.

With the basic stitch length at 4 mm the threaded pin 6 limits the maximum roller-overfeed feed length to 5 mm.

- | | |
|------------|--|
| 1 = lever | raises the feed roller |
| 2 = button | automatically lowers feed roller
the function is entered at the control field |



Caution: danger of injury

Turn off the main switch.
The feed length may only be adjusted with the sewing machine switched off.

Adjusting the maximum feed length

- Remove threaded pin 6.
The maximum feed length is increased to 7 mm.



IMPORTANT

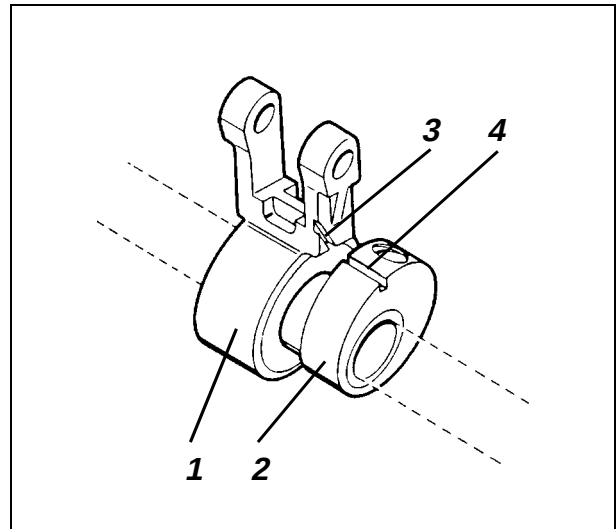
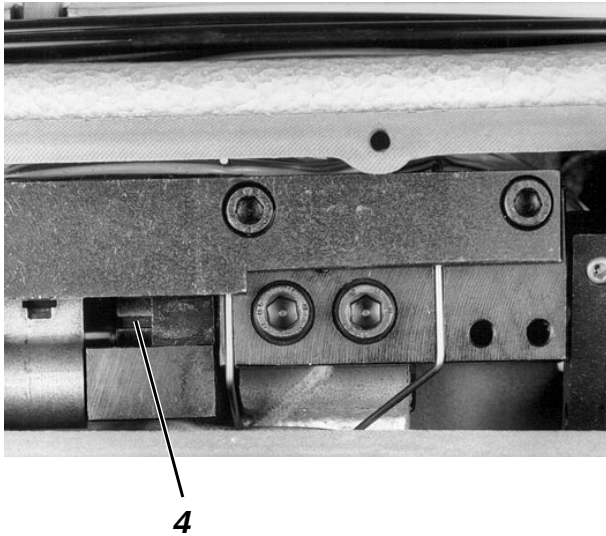
Account must be taken of the machine's basic sewing equipment.

Adjusting the raising and lowering function

- Set the desired function at the control field.
(See setting-up instructions, section 12).



2.7.1 Synchronisation of underfeed and roller overfeed



Caution: danger of injury

Turn off the main switch.
Synchronisation may only be adjusted with the sewing machine switched off.

Regulation and inspection

The operation of the underfeed and roller overfeed should be synchronised.

On no account may the movement of the overfeed roller be completed before that of the feed dog.

This ensures that the material between the sewing foot and the roller remains under tension, thus minimising seam-crimping when the stitches are tightened.

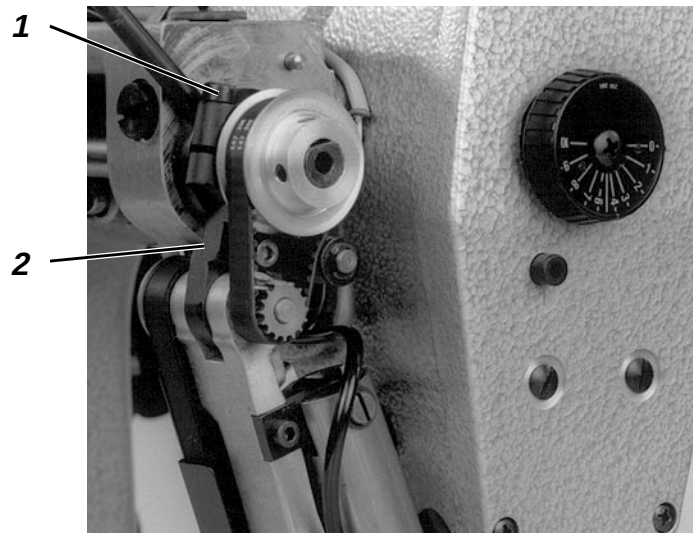
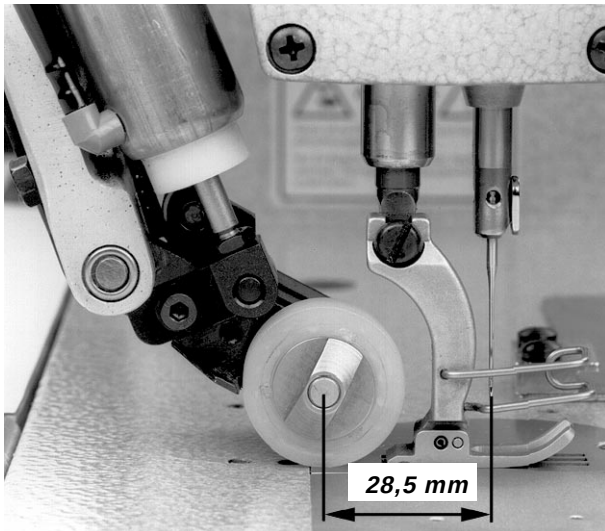
- Remove bobbin-winder cover.
- Lock the sewing machine:
class 273: in position **B**
class 274: in position **E**.
- The groove 4 of the cam 2 and the groove 3 of the connecting rod 1 must coincide.

Adjustment

- Remove locking pin.
- Undo fastening screws of cam 2.
It should be possible to rotate the cam on the shaft with minimum effort.
- Secure cam 2 with a screwdriver.
- Turn handwheel:
class 273: to position **B**
class 274: to position **E**.
- Retighten fastening screws of the cam 2.
- Check that groove 4 of the cam and groove 3 of the connecting rod coincide.
If not, the adjustment must be repeated.
- Replace bobbin-winder cover.



2.7.2 Distance between feed roller and needle



Regulation and inspection

The distance between the centre of the roller and that of the needle is 28.5 mm.

Where a compensating hinged foot is fitted the distance is 30 mm.



IMPORTANT

When the distance is reset the upper and lower end positions must also be re-adjusted (see section 2.7.3).



Caution: danger of injury

Turn off the main switch.

The distance may only be adjusted with the sewing machine switched off.

Adjustment

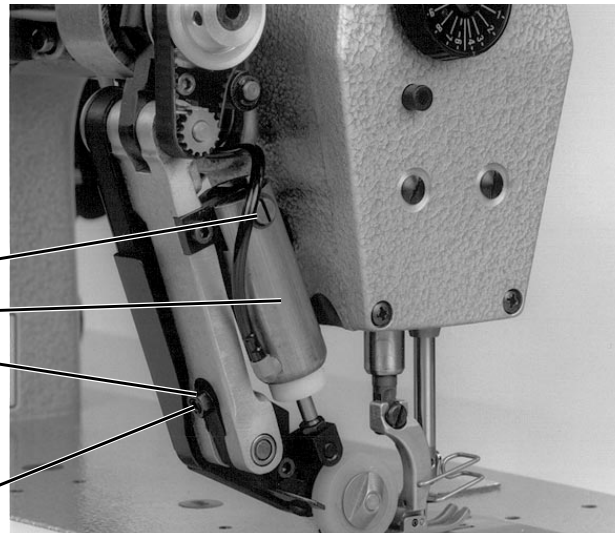
- Undo screw 1.
- Turn link 2 on the axle.
The distance between the centres of the roller and the needle must be 28.5 or 30 mm.
- Retighten screw 1.



2.7.3 Feed-roller lift



1



2

3

4

5

Regulation and inspection

In the **upper end position** the lifted feed roller must not touch the sewing foot.

In the **lower end position**, after the roller has been placed on the needle plate, the link 1 must encounter elastic resistance about 1 mm before the hand-lever stop reaches its limit position.

If a **steel roller** is used there must still be a gap in the lower end position. The steel roller must not make contact with the needle plate, which it would damage.



Caution: danger of injury

Turn off the main switch.

The lift may only be adjusted with the sewing machine switched off.

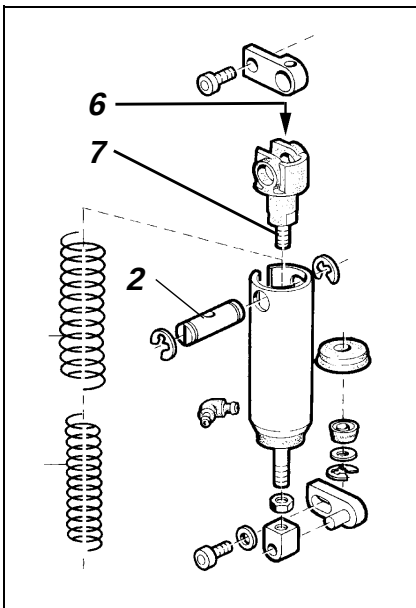
Adjusting the upper end position

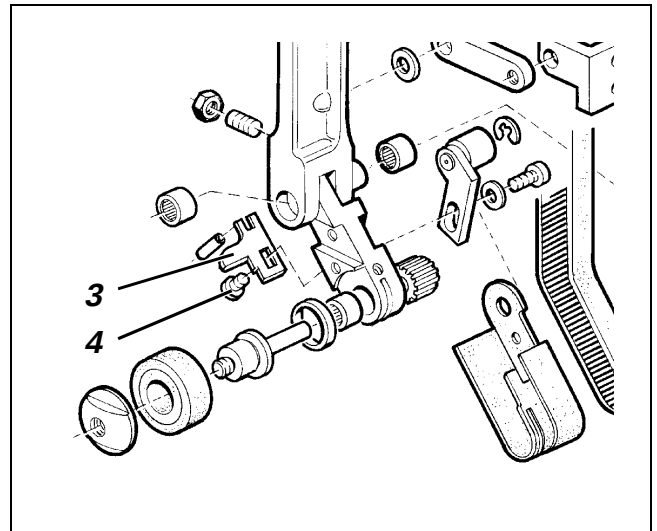
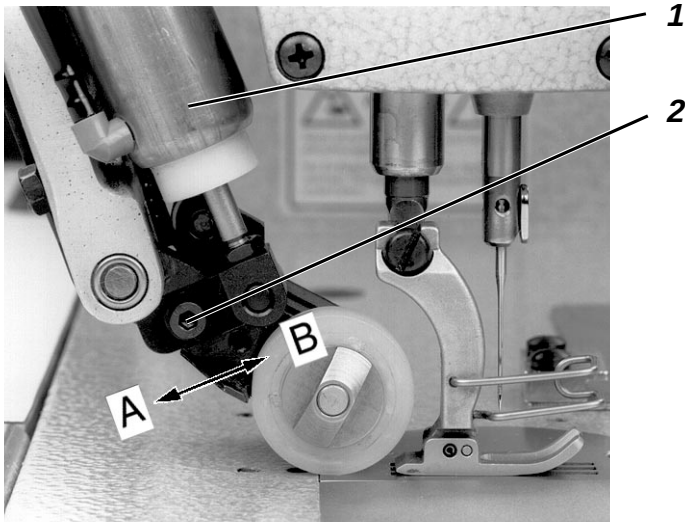
- Rotate bolt 2.
The slit of the bolt must be parallel to the cylinder axle.
- Limit the stroke of cylinder 3.
Use a 2.5 mm Allen key to adjust the threaded pin 7 accordingly.

6 = access to threaded pin 7

Adjusting the lower end position

- Undo locknut 4.
- Screw threaded pin 5:
in: to raise
out: to lower.
- Retighten locknut 4.





2.7.4 Roller pressure

Regulation and inspection

The feed-roller pressure must be suitable for the material being sewn.



IMPORTANT

If the pressure has been altered the upper end position must be re-adjusted (see section 2.7.3).



Caution: danger of injury

Turn off the main switch.
The roller pressure may only be adjusted with the sewing machine switched off.

Adjustment

- Undo screw 2.
- Move cylinder 1:
in the direction of arrow **A**: to reduce pressure
in the direction of arrow **B**: to increase pressure.
- Retighten screw 2.

2.7.5 Fabric deflector

Regulation and inspection

The function of the fabric deflector 3 is to prevent the material from getting into the gap. The pressure of the fabric deflector on the roller should be such that the roller can only just rotate freely. If a steel roller is fitted, the fabric deflector must be removed.



Caution: danger of injury

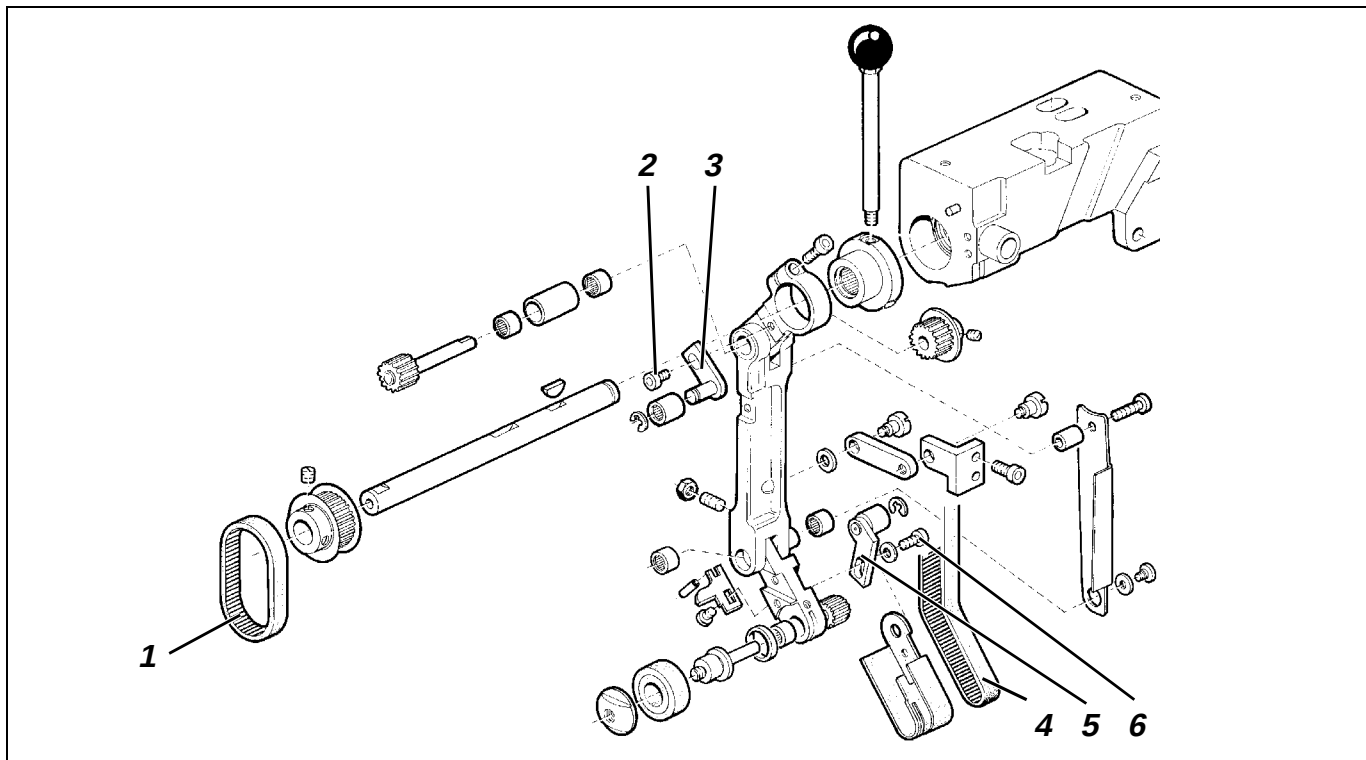
Turn off the main switch.
The fabric deflector may only be adjusted with the sewing machine switched off.

Adjustment

- Undo screw 4.
- Adjust fabric deflector 3.
- Retighten screw 4.



2.7.6 Roller-overfeed belt tension



Regulation and inspection

The tension in the synchronous belts should so be such that the step lengths are precisely transmitted.

Excessive belt tension can cause heavy wear and malfunctions.



Caution: danger of injury

Turn off the main switch.

The upper and lower belt tension may only be adjusted with the machine turned off.

Adjusting the upper synchronous belt

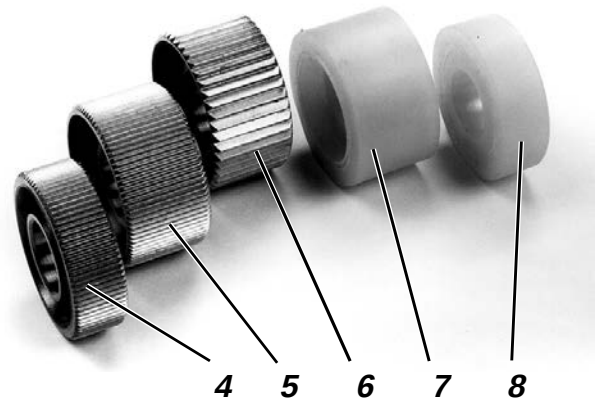
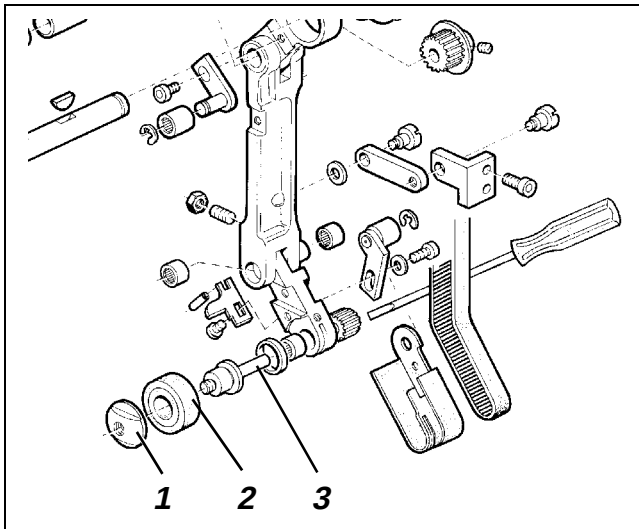
- Undo screw 2.
- Move lever 3.
Adjust the tension of the synchronous belt 1 as required.
- Retighten screw 2.

Adjusting the lower synchronous belt

- Undo screw 6.
- Move lever 5.
Adjust the tension of the synchronous belt 4.
- Retighten screw 6.



2.7.7 Replacing the feed roller



IMPORTANT

If a Vulkollan roller is replaced by a steel roller or vice versa, the lower end position must be re-adjusted (see section 2.7.3).

If a steel roller is fitted, the fabric deflector must be removed.

If the 15mm-wide rubber roller is being used, the broad fabric deflector (order no.: 0273 000620) must be fitted.



Caution: danger of injury

Turn off the main switch.

The feed roller must be replaced with the sewing machine switched off.

Replacing the roller

- Remove nut 1.
IMPORTANT: this nut has a left-handed thread.
Lock axle 3 at the other end with a screwdriver.
- Replace feed roller 2.
- Replace nut 1.

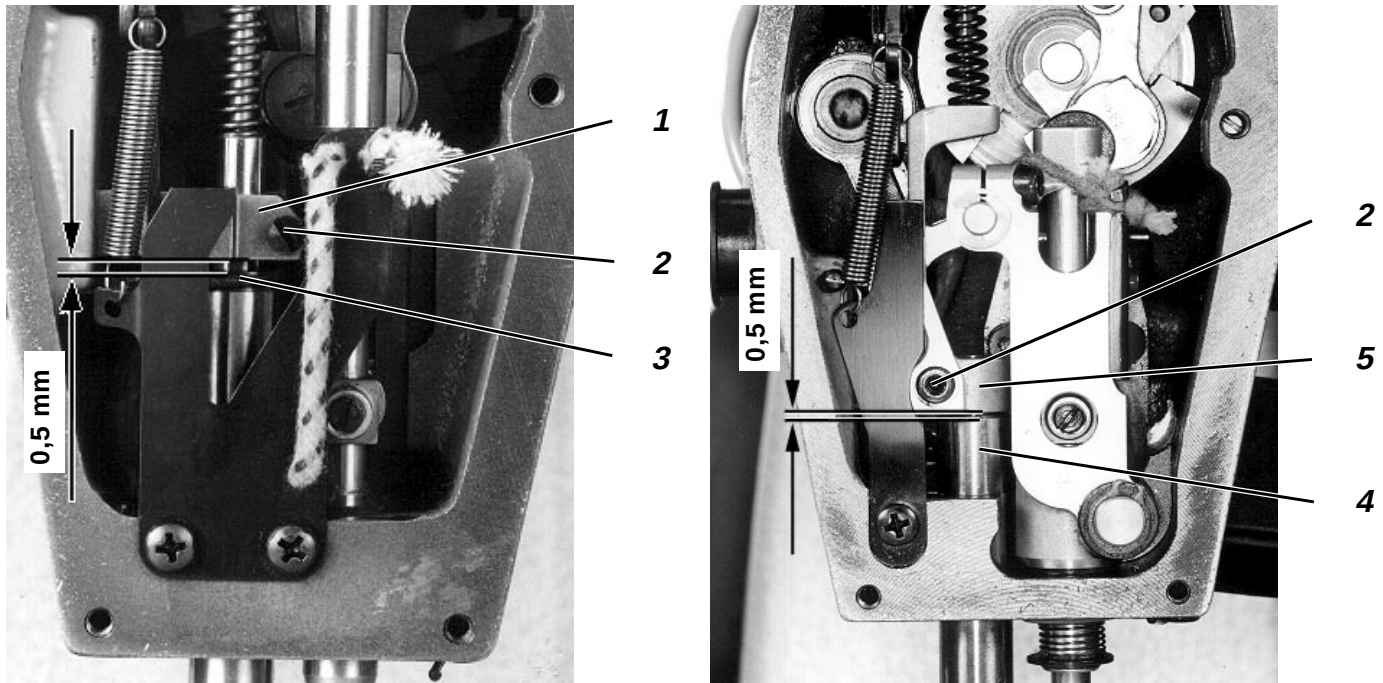
item	order no.:	description
4	0933 005763	steel roller 9 mm
5	0933 005737	steel roller 15 mm
6	0933 005738 a	steel roller 15 mm, 2 mm saw-tooth
7	0933 005737 a	rubber roller 15 mm
8	0933 005725	Vulkollan roller 9 mm



3. Foot height and lift

The maximum sewing-foot lift is 12 mm for machines without a thread clipper and 7 mm for machines with a thread clipper.

3.1 Pressure-bar height



Regulation and inspection

Class 271/273/275

When the sole of the foot is in contact with the needle plate there should be a distance of 0.5 mm between the block 1 and the traction bracket 3.

Class 272/274

When the sole of the foot is in contact with the needle plate there should be a distance of 0.5 mm between the block 1 and the bush 4.



Caution: danger of injury

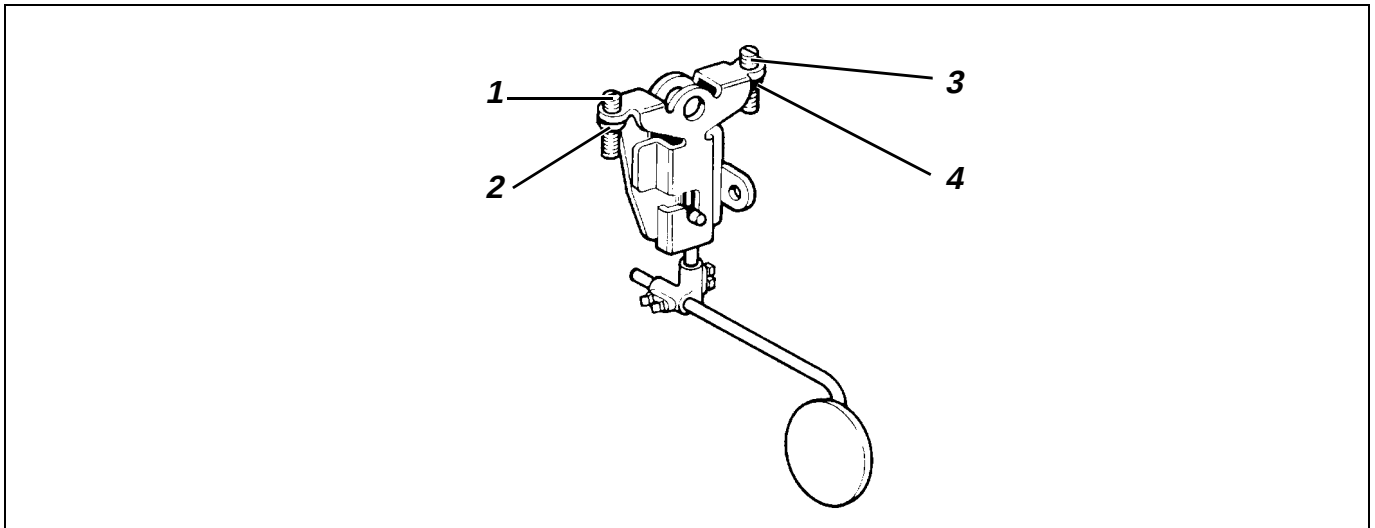
Turn off the main switch.
The height of the pressure bar may only be adjusted with the sewing machine switched off.

Adjustment

- Remove cover.
- Undo screw 2.
- Adjust the pressure-bar height.
The distance should be 0.5 mm as described above.
- Align the sewing foot so that the needle enters the centre of the sewing-foot needle hole and retighten screw 2.
- Replace cover.



3.2 Mechanical foot lift



Regulation and inspection

With the sewing foot in contact with the needle plate a small amount of free movement must be perceptible in the knee lever.



Caution: danger of injury

Turn off the main switch.
The knee lever may only be adjusted with the sewing machine switched off.

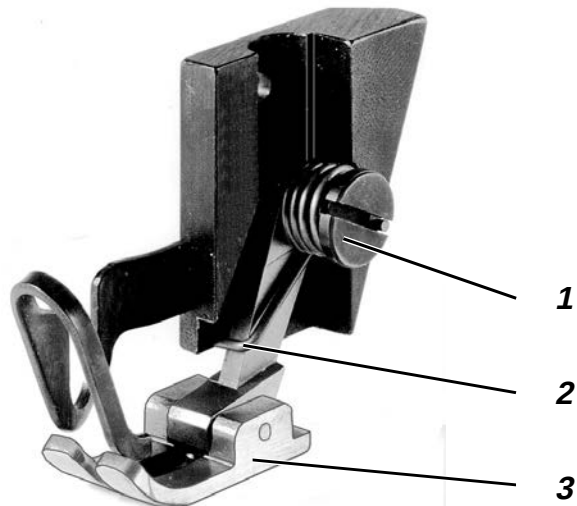
Adjustment

- Undo nut 4.
- Adjust the maximum lift with stop screw 3.
- Retighten nut 4.

- Undo nut 2.
- Adjust screw 1.
With the sewing foot in contact with the needle plate a small amount of free movement must be perceptible in the knee lever.
- Retighten nut 2.



3.4 Hinged foot



Regulation and inspection

With the hinged foot the height of the pressure bar should be such that when the foot is lowered the sole of the foot executes only a small feed movement on the needle plate before the block makes contact with the pressure bar (see page 22).

This ensures that only the sprung sole exerts slight pressure on the material.



Caution: danger of injury

Turn off the main switch.

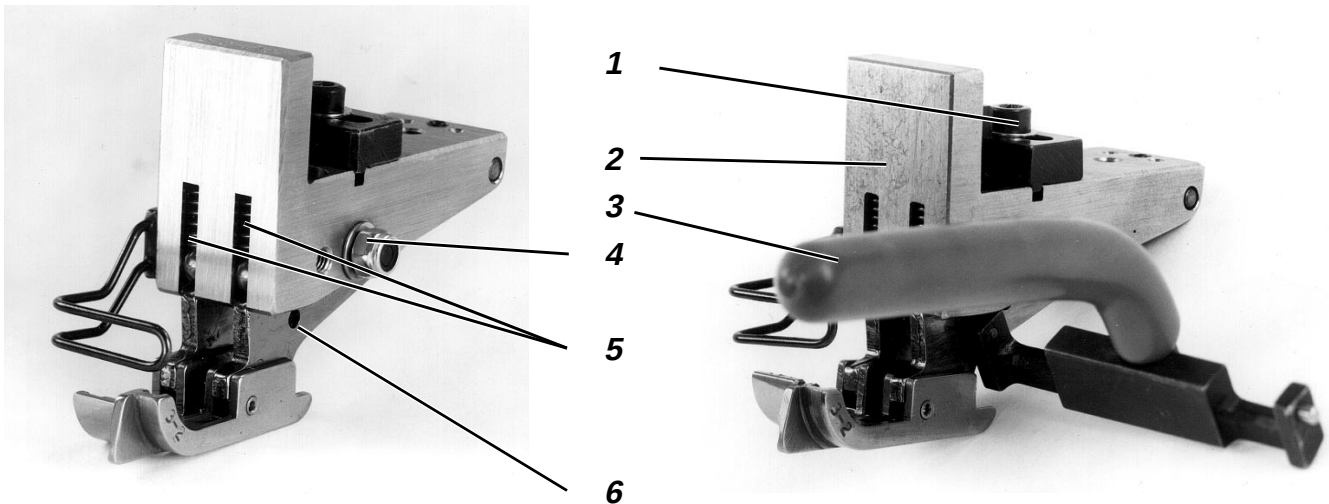
The hinged foot may only be adjusted with the sewing machine switched off.

Adjustment

- Adjust the pressure bar (see section 3.1).
- Undo the screw on the back of the bolt 1.
- Adjust bolt 1.
The torsion spring 2 determines the pressure exerted by the sole of the foot 3.
The resilience of the spring should be adjusted with bolt 1 so that the fabric layers are sewn together with stitches of equal length, and without being shifted with respect to each other.
- Retighten the screw on the back of the bolt 1.



3.4.1 Compensating hinged foot



Regulation and inspection

With the compensating hinged foot the pressure exerted by the sole of the foot is altered by replacing the pressure springs 5. Two pairs of springs of different strengths are supplied with each foot. To alter the backstitch width to the left or right of the needle only the sole of the foot needs to be replaced.



Caution: danger of injury

Turn off the main switch.
Foot pressure may only be adjusted with the sewing machine switched off.

Adjustment

- Remove nut 4 with screw.
- Insert extractor tool 3 in the hole 6.
- Prise off the sole of the foot.
- Fit new sole to alter the backstitch width. Replace springs.
- Replace sole of the foot.
- Replace nut 4 with screw.
- Undo screw 1.
- Align the sewing foot so that the needle enters the centre of the sewing-foot needle hole.
- Retighten screw 1.

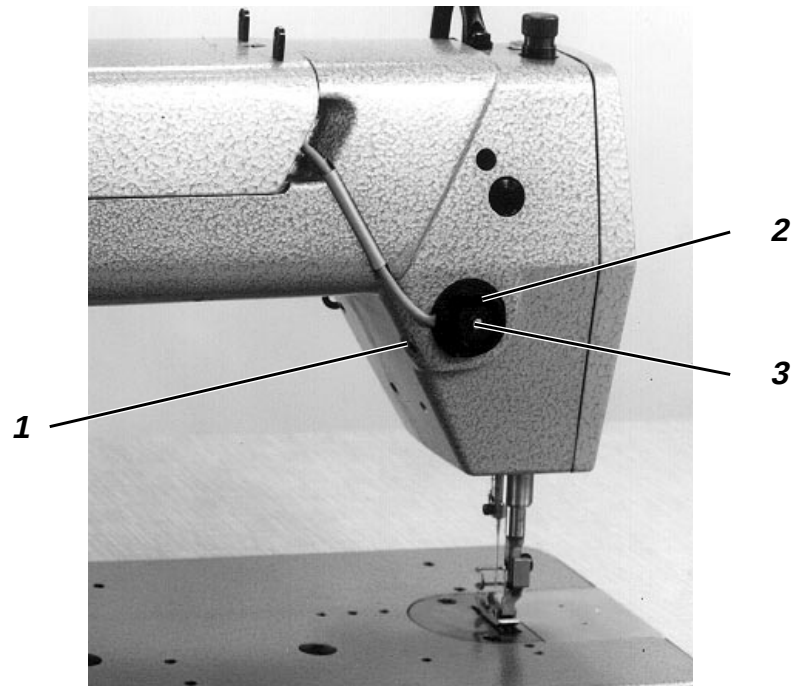


IMPORTANT

In the raised position there must be a small gap (about 0.5 mm) between the block 2 of the compensating hinged foot and the fabric-rod bush.



4. Upper-thread tensioner release



Regulation and inspection

Pressing on the axle 3 opens the tensioner by about 1 mm.



Caution: danger of injury

Turn off the main switch.

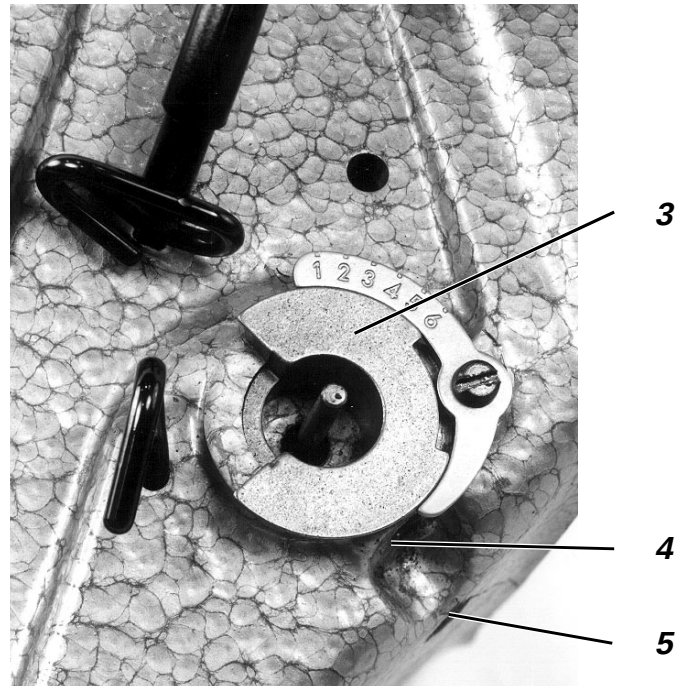
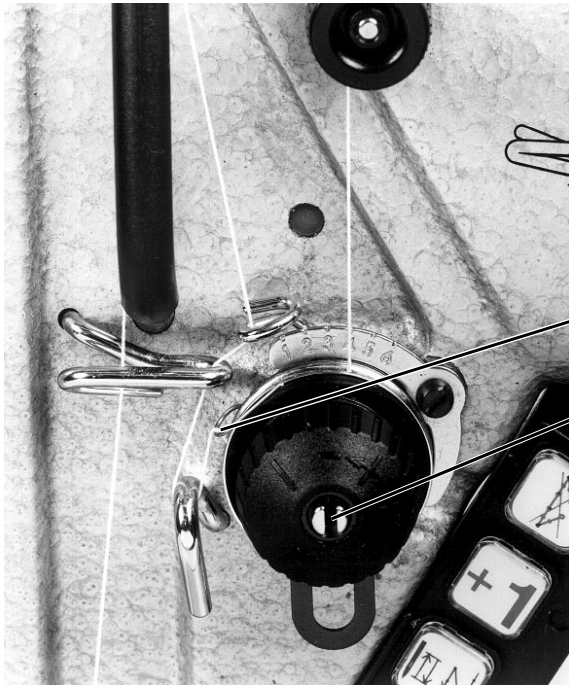
The upper-thread tensioner release may only be adjusted with the sewing machine switched off.

Adjustment

- Undo screw 1.
- Move magnet 2.
With the upper-thread tensioner fully closed and with no thread between the tension discs the axle 3 should have play of about 0.3 mm.
- Retighten screw 1.



4.1 Thread take-up spring



Regulation and inspection

The thread take-up spring 1 should keep the upper thread under tension at least until the tip of the needle has penetrated the material.



Caution: danger of injury

Turn off the main switch.

The thread take-up spring may only be adjusted with the sewing machine switched off.

Adjusting the spring travel

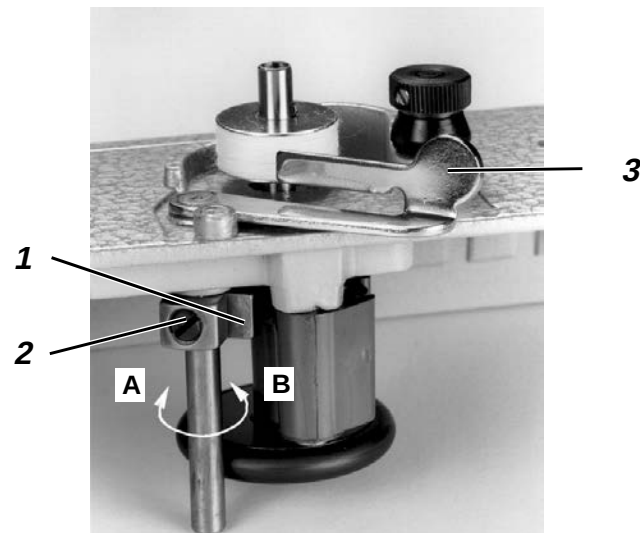
- Undo screw 4.
- Rotate bush 3.
The spring 1 must pre-tension the upper thread at least until the tip of the needle enters the material.
- Retighten screw 4.

Adjusting the spring tension

- Undo screw 5.
- Adjust the tension value by rotating the tension bolt 2.
The tension of the thread-tension spring must be between 20 and 50 cN (1 cN = 1 g) depending on the material and thread.
- Retighten screw 5.



5. Bobbin winder



Regulation and inspection

The bobbin winder should automatically turn off when the bobbin is fully wound to a point 0.5 mm under the rim.



Caution: danger of injury

Turn off the main switch.

The bobbin winder may only be adjusted with the sewing machine switched off.

Adjustment

1. Minor adjustments to the wind-on quantity

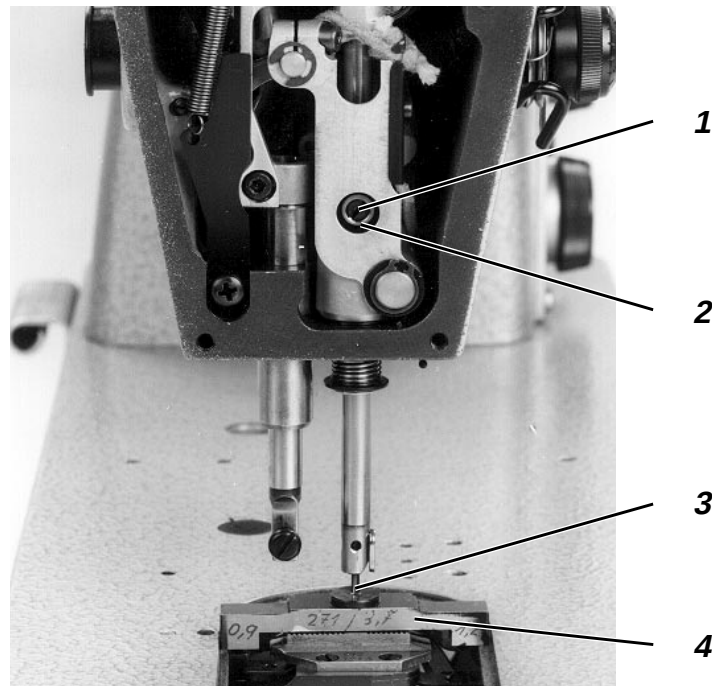
- Bend bobbin-winder sensor 3.

2. Major adjustments to the wind-on quantity

- Remove bobbin-winder cover.
- Undo screw 2.
- Rotate trip cam 1:
 - in the direction of arrow **A**: to reduce the wind-on quantity
 - in the direction of arrow **B**: to increase the wind-on quantity.
- Retighten screw 2.
- Replace bobbin-winder cover.



6. Needle-bar height



Regulation and inspection

Classes 271/273/275 and 272/274 have differing needle-bar heights. Adjustment and inspection are carried out with gauges 3 and 4.



Caution: danger of injury

Turn off the main switch.
The needle-bar height may only be adjusted with the sewing machine switched off.

Adjustment

- Remove needle plate and sewing foot.
- Undo screw 1.
- Place gauge 4 on the needle-plate surface.

order no.: 0271 000767 for small shuttle (0271 000751/0271 001991)
order no.: 0271 000766 for large shuttle (0271 001021/ 0271 002041)

- Fit gauge 3 as far as it will go into the needle bar in place of a needle.

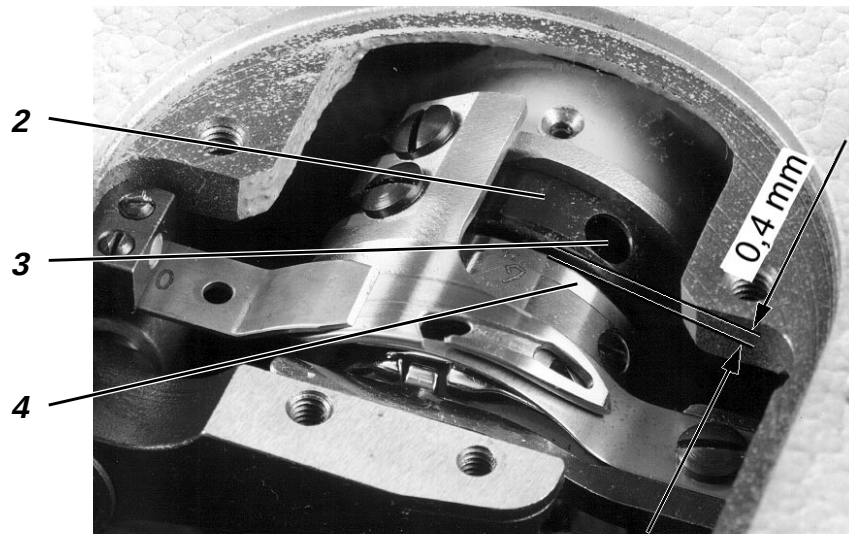
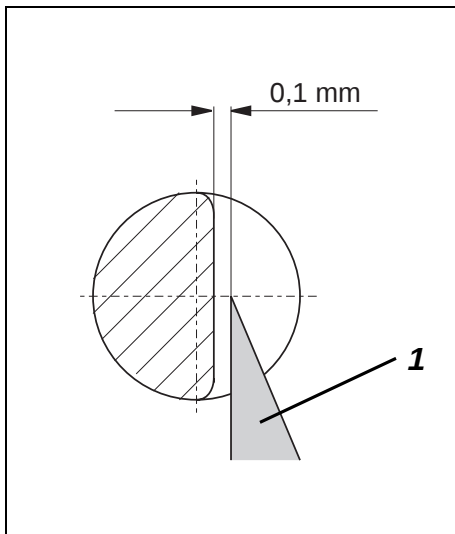
order no.: 0216 001069 for **class 271/273/275**
order no.: 0272 001240 for **class 272/274**

- Lock sewing machine in position **E**.
The cross-head 2 is at its lowest position.
 - Push the needle bar downwards.
The foot of the gauge 3 must make contact with gauge 4.
 - Retighten screw 1.
- IMPORTANT**
The needle-attachment screw must point to the right.
- Replace needle plate and sewing foot.



7. Shuttle adjustments

7.1 Loop lift and distance between shuttle beak and needle



Regulation and inspection

The loop lift is the travel of the needle bar from BDC to the point at which the shuttle beak is at the centre of the needle.
The loop lift is 1.8 mm.

With the sewing machine locked in position **A** the shuttle beak 1 should be at the centre of the needle.

The distance between the shuttle beak 1 and the needle should be 0.1 mm.



Caution: danger of injury

Turn off the main switch.

The loop lift and the distance between the shuttle beak and the needle may only be adjusted with the sewing machine switched off.

Adjustment

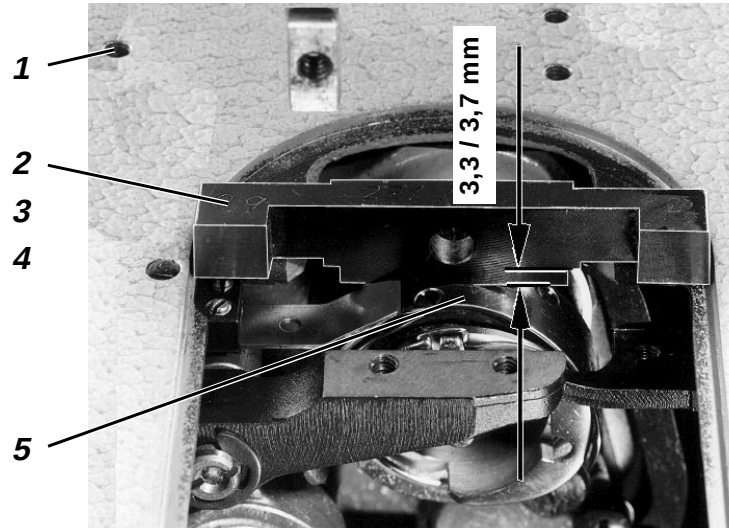
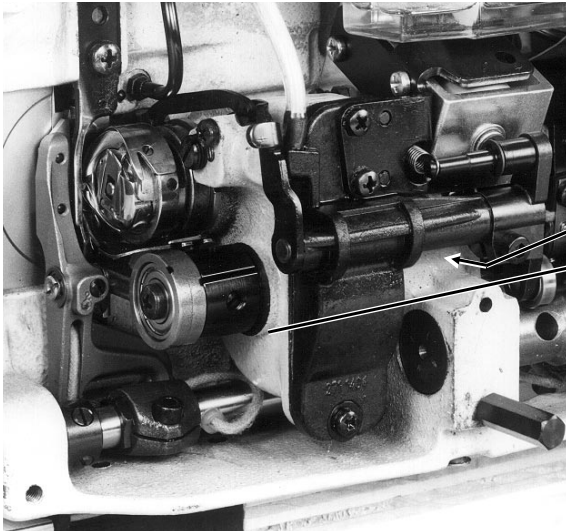
- Remove sewing foot, needle plate and feed dog.
Fit new needle.
- Set the stitch regulator to "0".
- Lock sewing machine in position **A**.
- Undo fastening screws of the shuttle 4.
The screws can be reached through hole 3.
- Set the shuttle beak 1 to the centre of the needle.
The distance between the shuttle beak 1 and the furrow of the needle must be 0.1 mm.
In this position there is a distance of 0.4 mm between the shuttle 4 and the adjusting ring 2.

If the distance of 0.4 mm is not achieved, the shuttle-drive housing should be adjusted accordingly (see section 7.2).

- Retighten fastening screws of the shuttle 4.
- Replace sewing foot, needle plate and feed dog.



7.2 Shuttle-drive housing



Caution: danger of injury

Turn off the main switch.

The shuttle-drive housing may only be adjusted with the sewing machine switched off.

Regulation and inspection

The shuttle-drive housing 4 is factory-aligned.

It may only be altered in exceptional circumstances.

With the shuttle-drive housing correctly aligned there must be a distance of 0.4 mm between the shuttle and the adjusting ring (see section 7.1).

The distance between the needle-plate surface and the thread-drawing plate 5 is:

with the small shuttle =	3.7 mm (0271 000751 / 0271 001991)
with the large shuttle =	3.3 mm (0271 001021 / 0271 002041)

Adjustment

- Loosen locking screw 1.
Under the locking screw there is a stop screw.
- Adjust the stop screw.
The distance between the needle-plate surface and the thread-drawing plate 5 is:

with the small shuttle = 3.7 mm
with the large shuttle = 3.3 mm

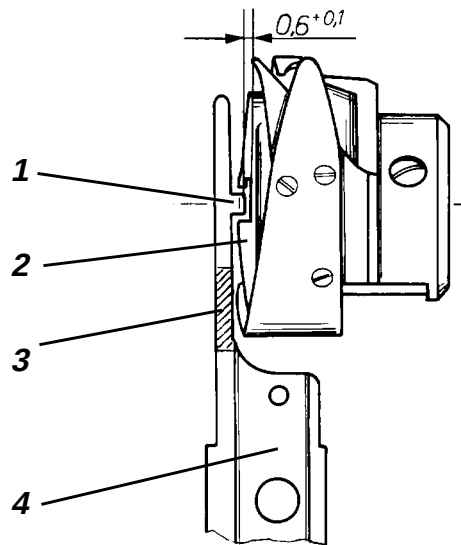
The distance is checked with gauge 2.

with the small shuttle = order no.: 0271 000767
with the large shuttle = order no.: 0271 000766

- Retighten locking screw 1.
- Undo 2 screws 3 of the shuttle-drive housing.
- Move the shuttle-drive housing 4.
Between the shuttle and the adjusting ring there must be a distance of 0.4 mm (see section 7.1).
- Retighten screws 3 of the shuttle-drive housing.
- Check the distance of the shuttle beak from the needle and adjust if necessary (see section 7.1).



7.3 Bobbin-housing holder



Regulation and inspection

The bobbin-housing holder is factory-aligned.

When the holder has been replaced the new holder may need to be re-aligned.



Caution: danger of injury

Turn off the main switch.

The bobbin-housing holder may only be adjusted with the sewing machine switched off.



IMPORTANT

Alignment may only be carried out in the cross-hatched area (see sketch).

The extreme hardness in the region of the retaining tab 1 means that there is a danger of breakage there.

Adjustment

- Align the bobbin-housing holder 4.
The distance between retaining tab 1 of the bobbin-housing holder 4 and the lower part of the bobbin-housing 2 should be $0.6^{+0.1}$ mm.

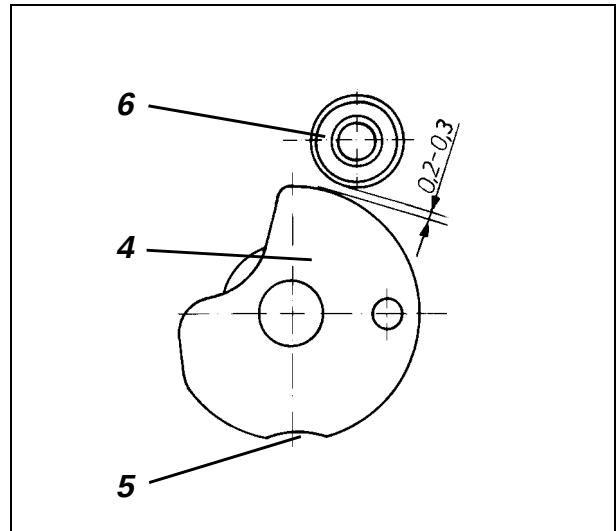
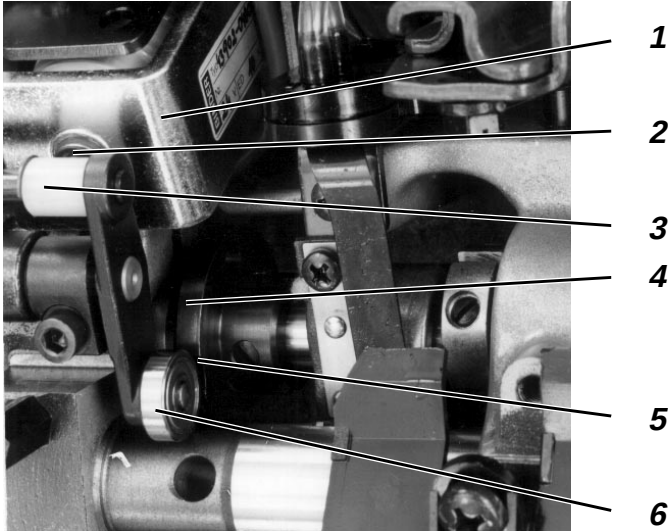


8. Thread clipper

The control cam 4 determines the movement of the thread clippers and the timing of the blade movement. The timing thus coincides with the movement of the stitch-forming components.

The thread clipper is switched on electromagnetically.

8.1 Control cam for timing the blade movement



Regulation and inspection

When the thread clipper is not in operation there must be a distance of 0.2 to 0.3 mm between the external diameter of the control cam 4 and the ball-race 6.

With the machine locked in position **D** ball-race 6 must engage in the indentation 5 of the control cam 4 when manually pressed downwards.



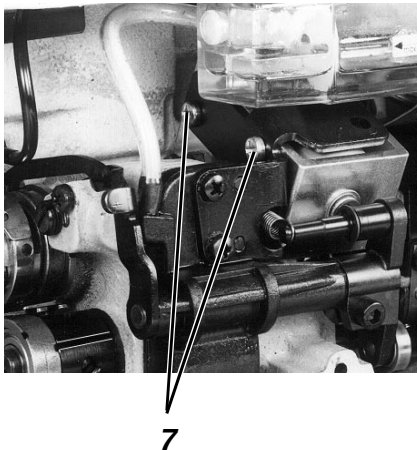
Caution: danger of injury

Turn off the main switch.

The control cam may only be adjusted with the sewing machine switched off.

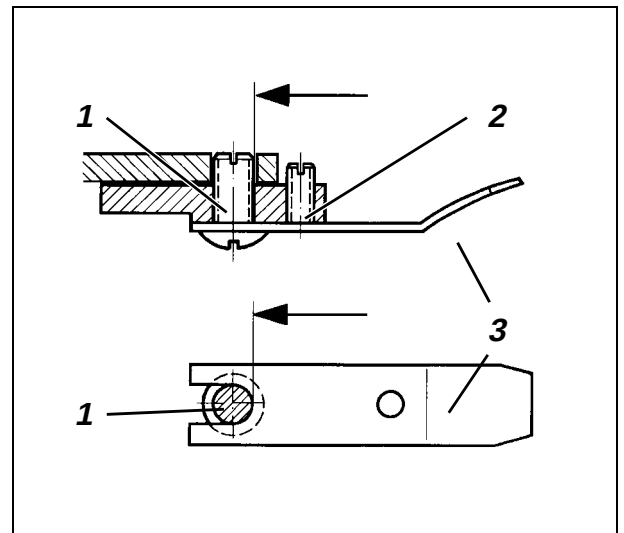
Adjustment

- Undo fastening screws 7 of the magnet 1.
- Move magnet 1.
The distance between control cam 4 and the ball-race 6 must be 0.2 - 0.3 mm.
The roller 3 must be in contact with the ram 2.
- Retighten fastening screws 7 of the magnet 1.
- Lock sewing machine in position **D**.
- Undo fastening screws of the control cam 4.
- Turn the control cam on the lower shaft.
The ball-race 6 must engage in the indentation 5 of the control cam 4 when manually pressed downwards.
The axial position should be such that the control cam 4 and roller 6 are opposite each other.
- Retighten fastening screws of the control cam 4.





8.2 Positioning the fixed blade



Regulation and inspection

The fixed blade 3 must lie in the direction of the arrow on the screw 1 (see sketch).

Sharpened blades must be aligned as described in section 7.3.



Caution: danger of injury

Turn off the main switch.

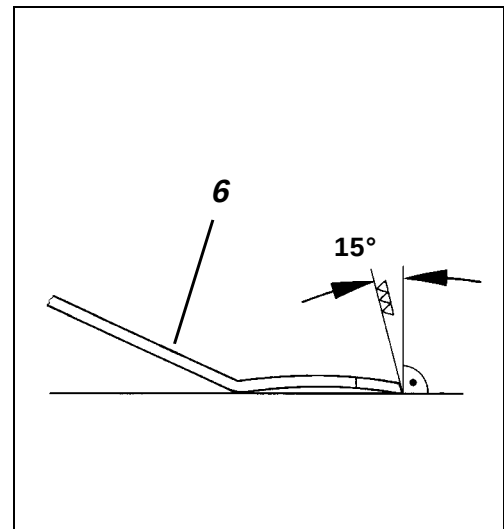
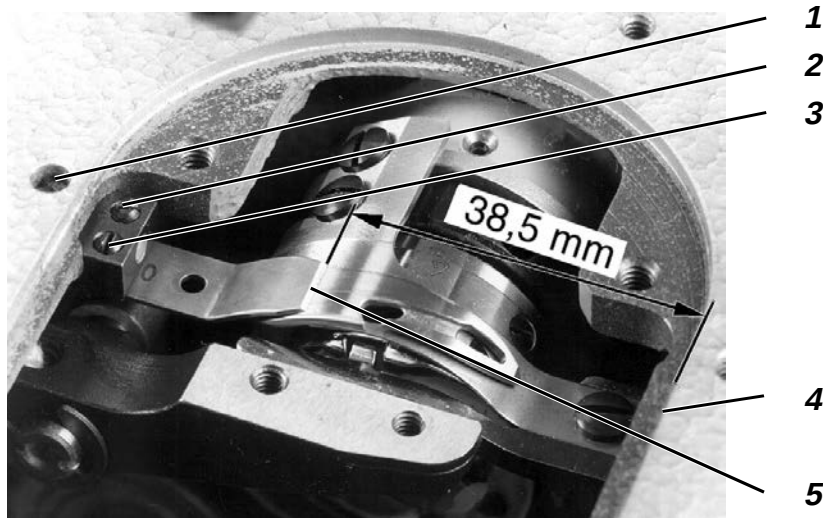
The fixed blade may only be adjusted with the sewing machine switched off.

Adjustment

- Unscrew cutting-pressure screws 2.
- Undo screw 1 from below.
- Push blade 3 in the direction of the arrow against screw 1.
- Partially tighten screw 1 from above.
- Adjust the cutting pressure (see section 8.6).
- Fully tighten screw 1 from below.



8.3 Sharpening the fixed blade



Regulation and inspection

The cutting angle of the fixed blade 6 is 15° (see sketch).

It is essential for sharpening to be carried out with a fine-grained whetstone.



Caution: danger of injury

Turn off the main switch.

After sharpening the blade must be replaced with the sewing machine switched off.



IMPORTANT

Blades which have lost more than 0.5 mm of their original length through sharpening must be replaced.

Adjustment

- Undo screws 2 and 3.
The pre-tension of the fixed blade 6 is reduced.
- Remove the blade 6.
- Sharpen the blade.
The cutting angle of the fixed blade is 15°.
- Replace the blade.
- Align the blade so that the distance between the cutting edge 5 and the edge 4 of the opening in the needle plate is 38.5 mm.

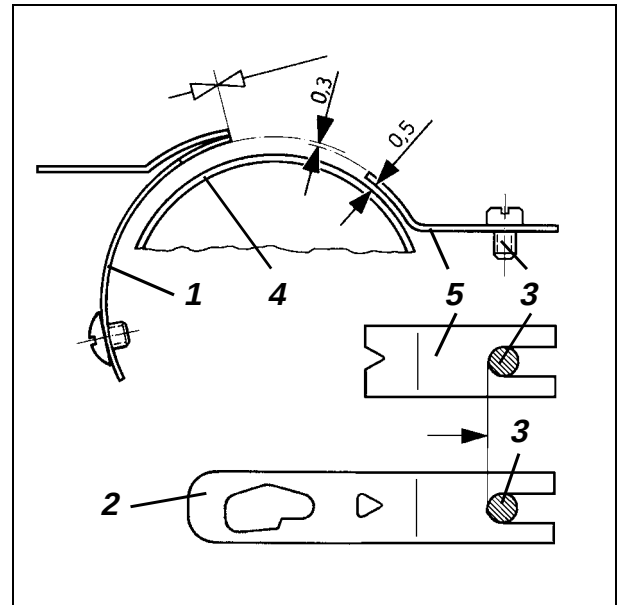
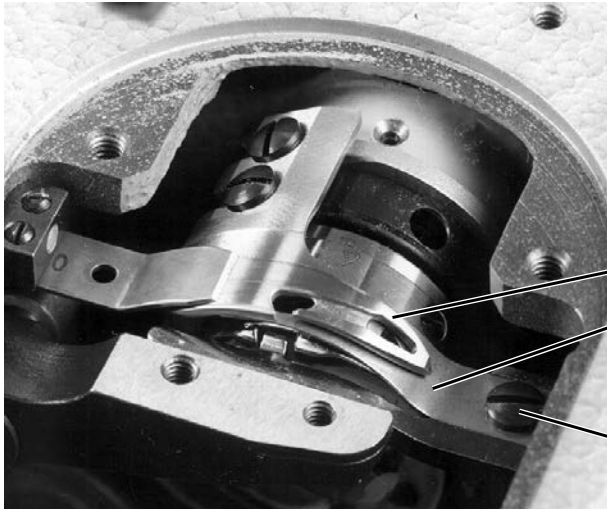
IMPORTANT

When replacing a blade after sharpening it must not be allowed to make contact with the screw 1.

- Fully tighten screw 1.
- Re-adjust the at-rest position of the hooked blade (see section 8.5) and the cutting pressure (see section 8.6).



8.4 Thread-guide plate, adjusting plate



Regulation and inspection

Thread-guide plate 2 is used with the small shuttle, the adjusting plate 5 with the large shuttle.

The thread-guide plate 2 or adjusting plate 5 must point in the direction of the arrow on the screw 3 (see sketch).

In this position the radial distance between the thread-guide plate 2 or adjusting plate 5 and the thread-drawing plate 4 of the shuttle must be 0.5 mm.

There must be a radial distance of 0.3 mm between the thread-guide plate 2 or adjusting plate 5 and the hooked blade 1.



Caution: danger of injury

Turn off the main switch.

The thread-guide plate or adjusting plate may only be removed with the sewing machine switched off.



IMPORTANT

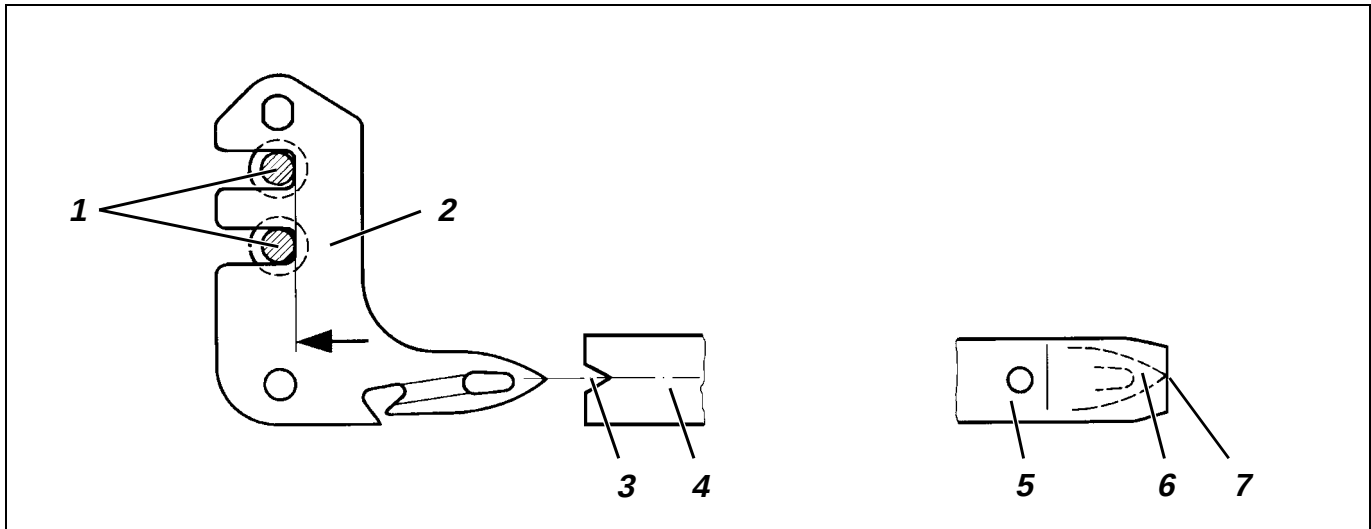
When the thread-guide plate (adjusting plate) has been fitted the distances to the thread-drawing plate 4 and hooked blade 1 must be checked.

Adjustment

- Partly undo screw 3.
- Remove thread-guide plate 2 or adjusting plate 5 for alignment.
- Align thread-guide plate 2 or adjusting plate 5.
- Replace the thread-guide plate 2 or adjusting plate 5 and secure with screw 3.



8.5 Hooked blade



Regulation and inspection

The hooked blade 2 must lie against the two screws 1 in the direction of the arrow.

With the hooked blade in the at-rest position its tip 6 and the cutting edge 7 of the fixed blade 5 must be at the same level.

During the blade movement the tip 6 of the hooked blade must be exactly beneath the tip of the triangle 3 in the thread-guide plate 4.



Caution: danger of injury

Turn off the main switch.

The hooked blade may only be adjusted with the sewing machine switched off.

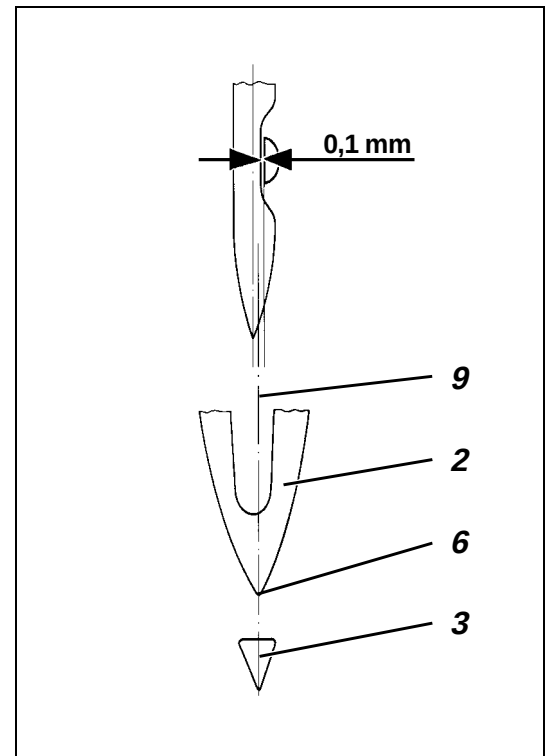
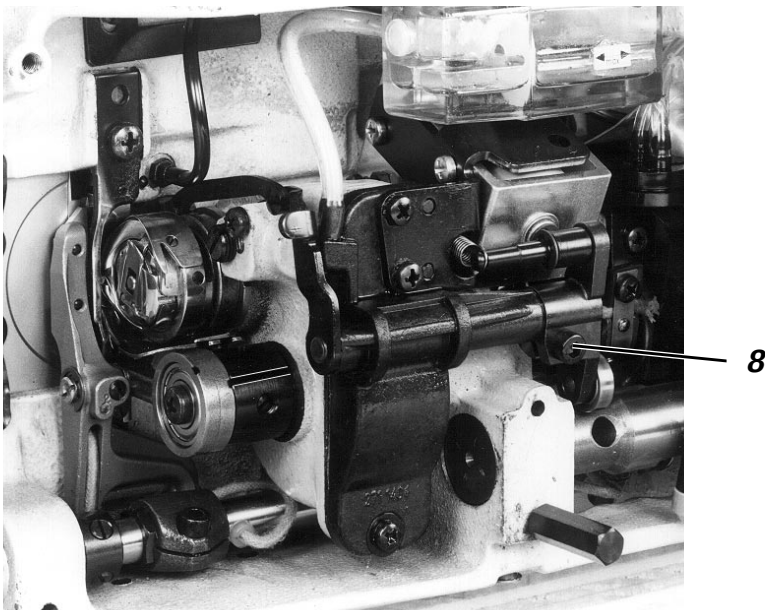
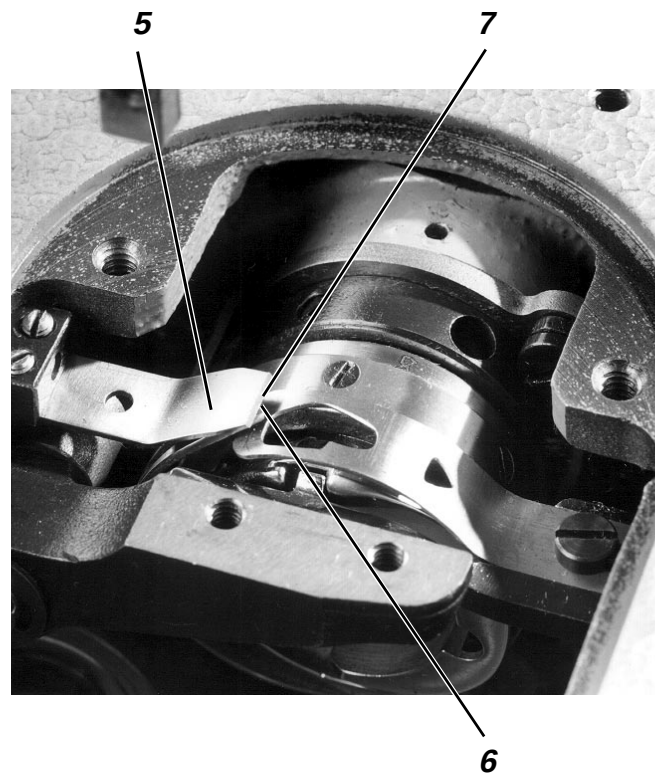
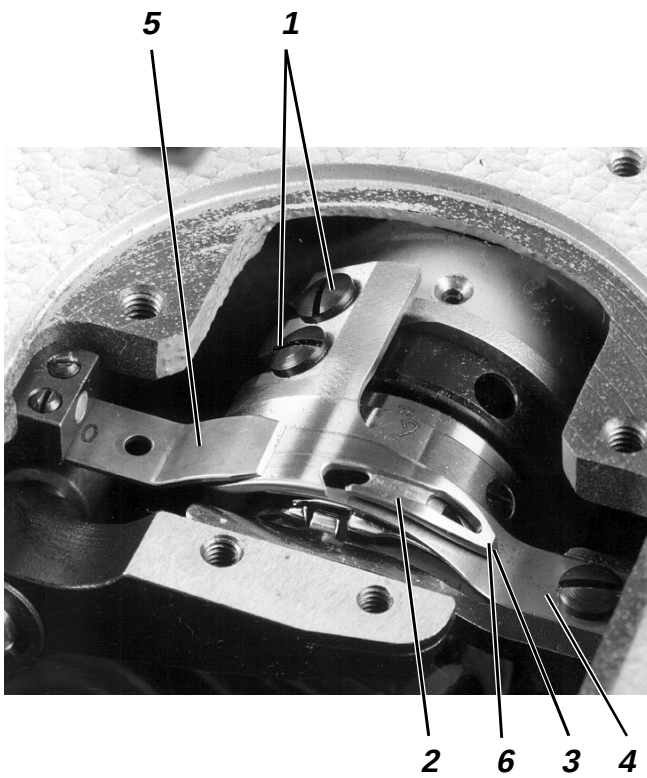
Adjustment

- Manually swivel hooked blade 2 upwards.
- Undo fastening screws 1 of the hooked blade.
- Push the hooked blade 2 in the direction of the arrow against the attachment screws 1.
- Retighten fastening screws 1.
- Undo screw 8.
- Adjust the at-rest position of the hooked blade 2.
With the hooked blade in its at-rest position its tip 6 and the cutting edge 7 of the fixed blade 5 must be at the same level.
- Retighten screw 8.
- Operate the hooked blade 2 manually.
Check that the tip 6 of the hooked blade coincides with the tip of the triangle 3.
- For adjustment undo screws 1 and align the hooked blade 2.

Adjustment note

With the hooked blade 2 properly adjusted its tip 6 moves along the line 9 during the cutting process.

The dotted line 9 runs approximately between the centre of the needle and the shuttle beak.





8.6 Cutting pressure



Regulation and inspection

The thread must be reliably severed with pressure as low as possible. Low cutting pressure minimises wear.

Two of the thickest threads used must be severed simultaneously.



Caution: danger of injury

Turn off the main switch.

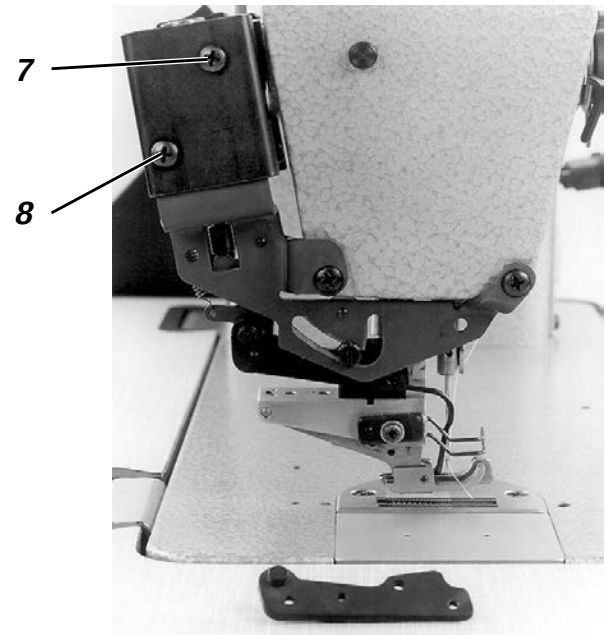
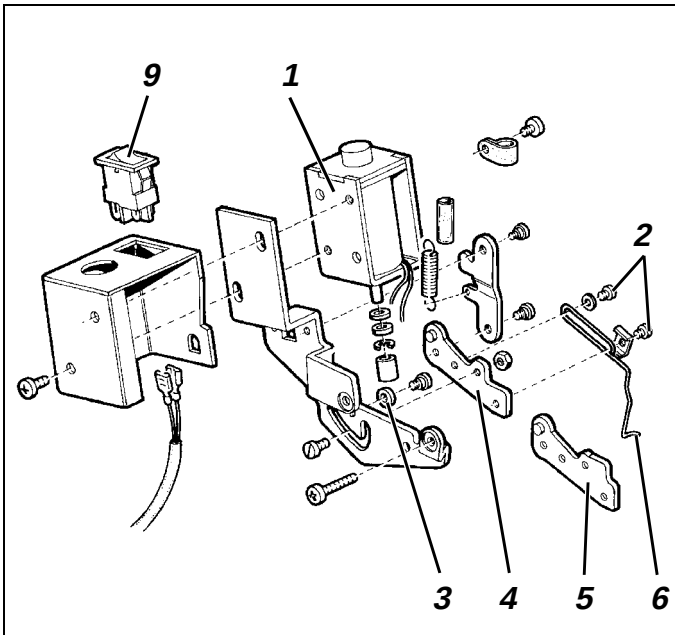
The cutting pressure may only be adjusted with the sewing machine switched off.

Adjustment

- Loosen the cutting-pressure screws 1.
- Swivel the hooked blade 4 under the fixed blade 2. The cutting edge 5 of the hooked blade must be under the cutting edge 3 of the fixed blade 2.
- Set the fixed blade 2 against the hooked blade 4 by screwing in the cutting-pressure screws 1.
- Alternately lay the thread to be severed to the right and left. Adjust the appropriate cutting-pressure screw.
- If the spring no longer returns the cutting mechanism to its starting position, the cutting pressure is too great. Sharpen (see section 7.3) or replace fixed blade 2.



9. Class 271/272: thread retractor



If at the start of a seam the upper thread-end is supposed to be pulled through to the underside of the material, it must not be caught between the sewing foot and the material. The thread retractor ensures that the upper thread-end hangs loosely from the eye of the needle.

The movement of the thread retractors takes place after the threads have been severed and before the sewing feet have been raised. The function can be set at the control.

The thread retractor can be switched on and off with the rocker switch 9.

Regulation and inspection

At the end of the forward retraction movement the lever 4 should be in contact with the Vulkollan disc 3.

The retraction movement should be completed without hindrance.



Caution: danger of injury

Turn off the main switch.

The thread retractor may only be adjusted with the sewing machine switched off.

Adjustment

- Undo screws 7 and 8.
- Adjust magnet 1.
At the end of the forward retraction movement the lever 4 should be in contact with the Vulkollan disc 3.
- Retighten screws 7 and 8.
- Undo screws 2.
- Adjust the retractor wire 6.
The retraction movement should be completed without hindrance.
- Retighten screws 2.

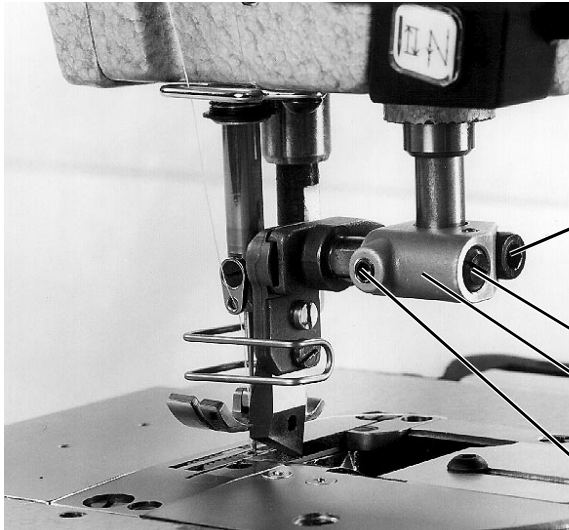


IMPORTANT

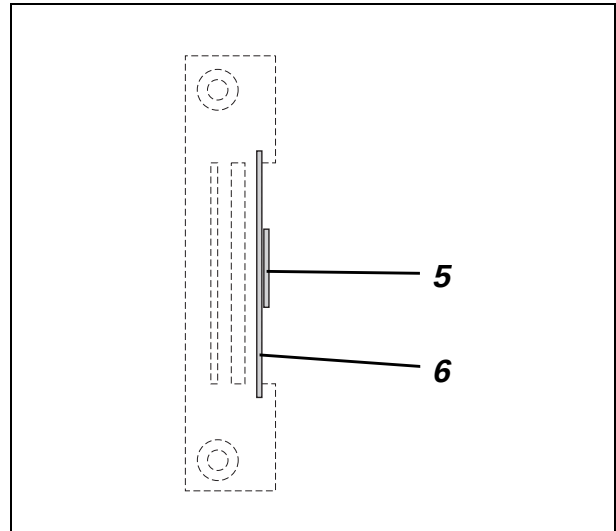
If the thread retractor is being used together with the compensating hinged foot, transmission lever 4 must be replaced by transmission lever 5 (order no.: Z120 001841).



10. Class 272: edge cutter



1
2
3
4



5
6

On sewing machines with this accessory the edge of the material can be cut during the sewing process.

In sub-classes **272 - 640141** and **272 - 640142** it is mechanically driven. It is switched on and off by a manual lever or button.

Programming the on-and-off function is described in the setting-up instructions, section 13.

The **272 - 740142** sub-class is fitted with a separate electrical drive.

Regulation and inspection

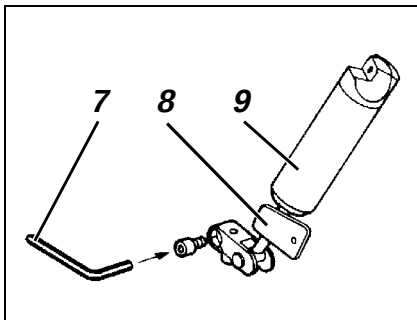
The edge cutter must cut reliably with the pressure as low as possible.



Caution: danger of injury

Turn off the main switch.

The edge cutter may only be adjusted with the sewing machine switched off.



1. Adjusting the position of the blades in the direction of sewing

- Undo screw 11.
- Adjust blade holder 10.
The point at which the blade begins to cut can be set in front of and behind the needle.
- Retighten screw 11.

2. Adjusting the cutting position

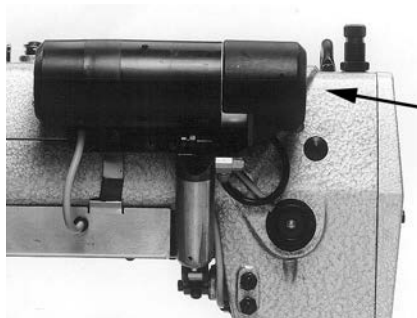
- Swivel the upper blade 5 down manually with the Allen key 7 (cylinder 9 extended). Secure the position with gauge 8.

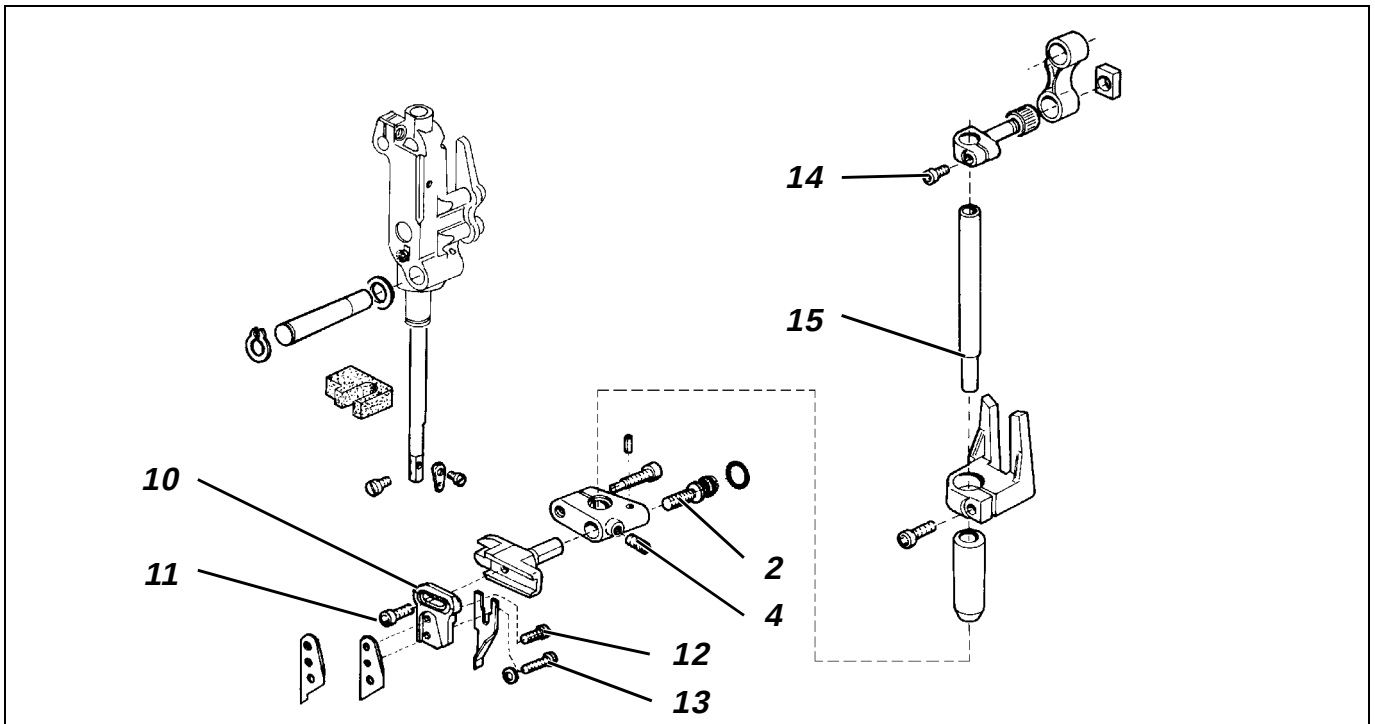
gauge 8

order no.: Z124 000443

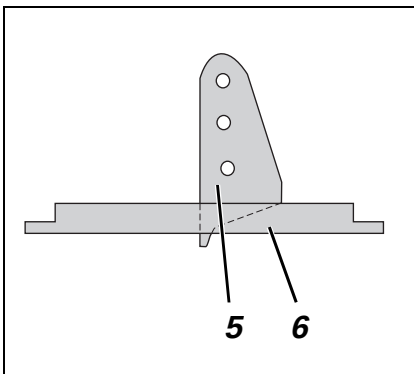
On sewing machines with a manual lever the manual lever is used to adjust the position of the upper blade.

- Move the upper blade 5 to **BDC** with the handwheel.
With sub-class **-740142** this is done with the knurled screw on the separate drive motor (see arrow).





- Undo screw 1.
- Adjust block 3.
The upper blade 5 should be parallel to the lower blade 6.
- IMPORTANT**
When the block 3 is turned it should be constantly pressed upwards and brought to rest against the ledge of the blade bar 15.
- Retighten screw 1.

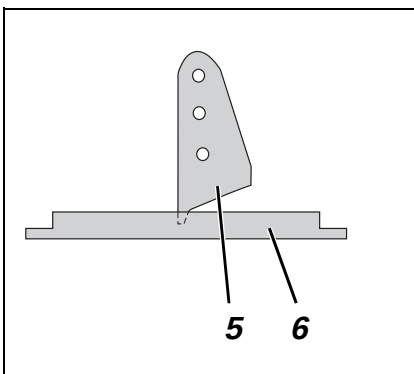


3. Adjusting the blade-height position

- Remove cover.
- Swivel the upper blade 5 down manually with the Allen key 7 (cylinder 9 extended). Secure the position with gauge 8.

On sewing machines with a manual lever the manual lever is used to adjust the position of the upper blade.

- Move the upper blade 5 to **BDC** with the handwheel.
With sub-class -740142 this is done with the knurled screw on the separate drive motor.
- Undo screw 14.
- Adjust the height of blade bar 15.
When the blade is at **BDC** the edge of the blade should be at the same level as the lower blade.
- Retighten screw 14.
- Check the blade position at **TDC**.
At **TDC** the tip of the blade should still be in contact with the lower blade.

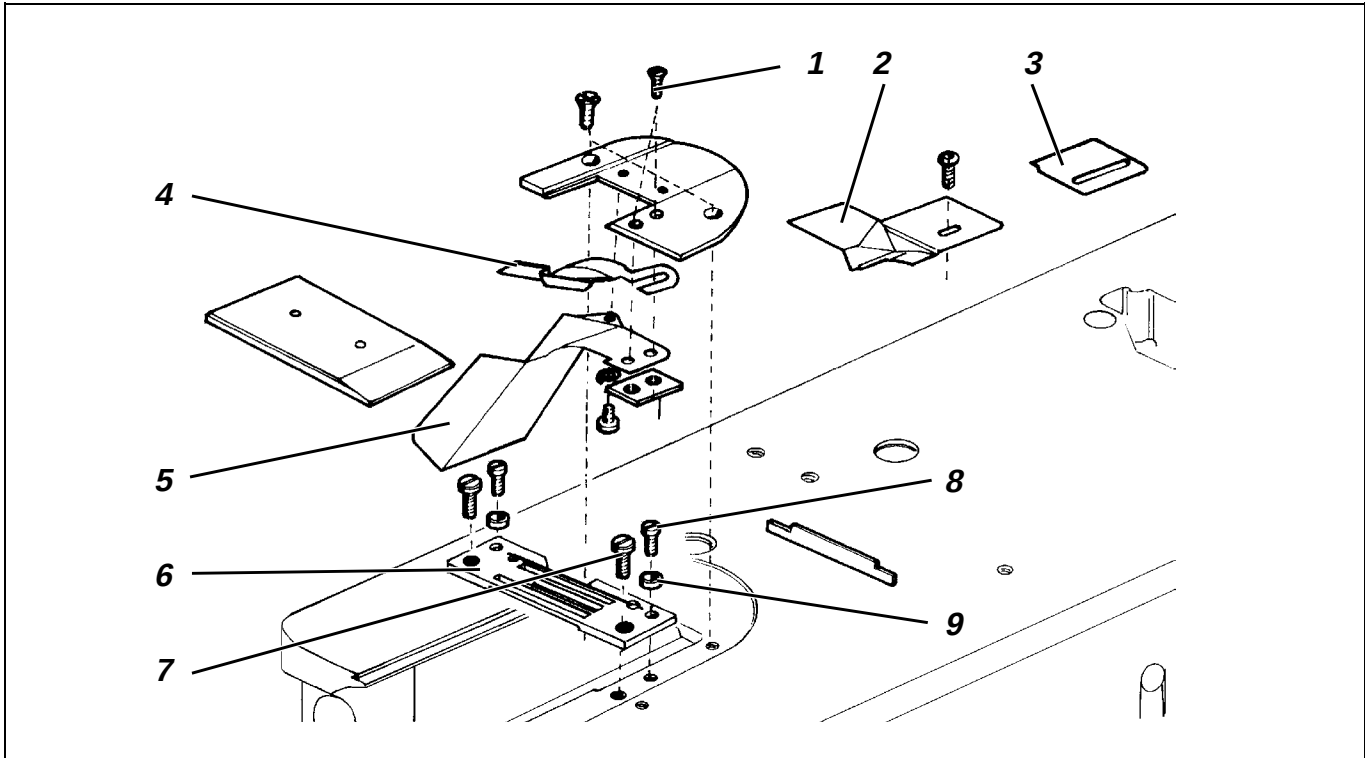


4. Adjusting the cutting pressure

- Undo threaded pin 4.
- Adjust screw 2.
Move the upper blade against the lower blade.
The edge cutter should cut reliably with the minimum possible pressure.
- Retighten threaded pin 4.
- Use the Allen key to carry out a manual cutting test.
Re-adjust the position and cutting pressure if necessary.



10.1 Replacing the sewing equipment



Regulation and inspection

The fitments should be selected in the light of the desired sewing result. The feed dog, slider and foot should be replaced or adjusted as required.



Caution: danger of injury

Turn off the main switch.
Fitments may only be replaced with the sewing machine switched off.

Replacing the sewing equipment (without replacing the needle plate)

- Remove the foot and slider.
- Remove 2 screws 7.
The centring sleeve 9 ensures that the position of the needle plate is correct.
The screw 8 must **not** be undone.
- Remove needle plate 6.
- Replace the sewing equipment.
- Replace needle plate 6.
- Retighten 2 screws 7.
- Carry out a manual cutting test and if necessary re-adjust the blade as described in section 9.
- Replace the foot and slider.

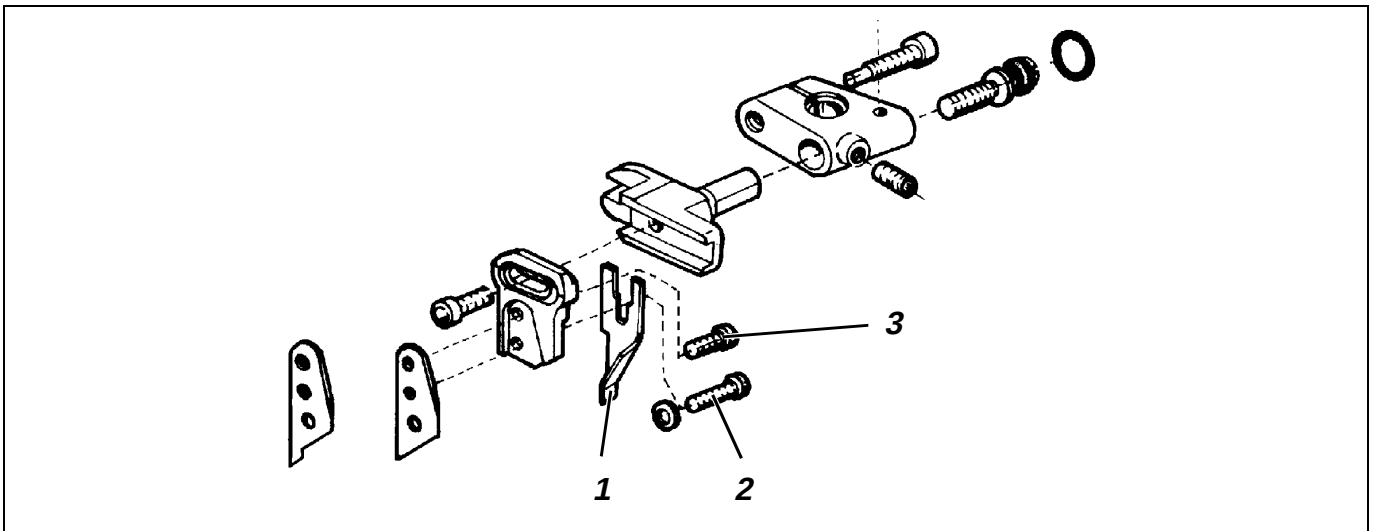
Replacing the sewing equipment (with replacement of the needle plate)

- Remove the foot and slider.
- Remove screw 7 and screw 8 with centring sleeve 9.
- Remove needle plate 6.
- Undo screw 1.
- Replace the sewing equipment.



- Adjust the guide 4.
The guide must be adapted to the width of the needle plate (cutting width).
- Fit new needle plate 6.
- Replace screw 7 and screw 8 with centring sleeve 9.
- Align needle plate.
The feed dog should run in the centre of the needle-plate slits.
- Retighten screws 8 and 7.
- Move the guide 4 against the lower blade.
- Retighten screw 1.
- Align the upper blade to the lower blade. See section 9.
Carry out a manual cutting test and if necessary re-adjust the blades.
- Replace the foot and slider.

10.2 Adjusting the indicator bracket



Regulation and inspection

The tip of the indicator bracket 1 indicates where the blade starts to cut.



Caution: danger of injury

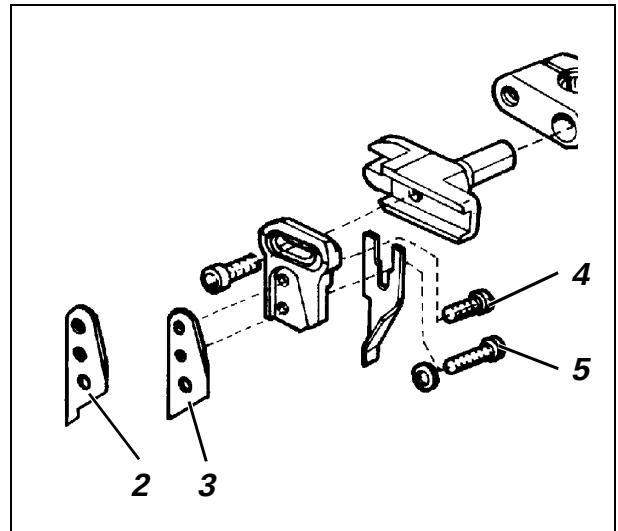
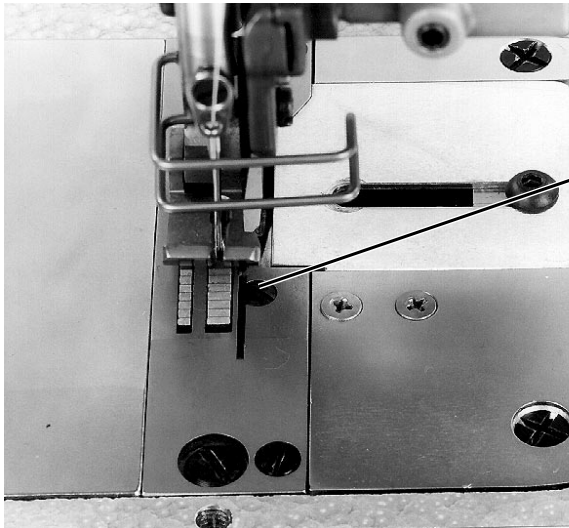
Turn off the main switch.
The indicator bracket may only be adjusted with the sewing machine switched off.

Adjusting the indicator bracket

- Undo screws 3 and 4.
- Adjust the indicator bracket 1.
The height adjustment should be such that the material passes freely beneath the bracket (use the thickest material).
The front edges of the bracket and the blade 2 must be in line with each other.
- Retighten screws 3 and 4.



10.3 Sharpening or replacing the blades



Regulation and inspection

The blade should cut reliably with the minimum possible pressure.

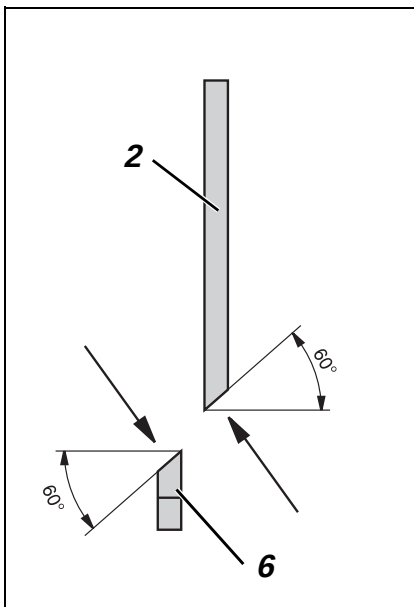


Caution: danger of injury

Turn off the main switch.
Replace the blade with the sewing machine switched off.

Replacing the upper blade

- Undo screws 4 and 5.
- Remove upper blade 2 or 3.
- Sharpen the upper blade.
IMPORTANT
Only the surface marked with the arrow may be sharpened.
- Replace the upper blade.
- Retighten screws 4 and 5.
- Carry out a manual cutting test and if necessary re-adjust the upper blade as described in section 9.
- Check the blade overlap at **TDC**.
If sharpening the upper blade has made it too short (the tip no longer makes contact with the lower blade) a new blade must be fitted.

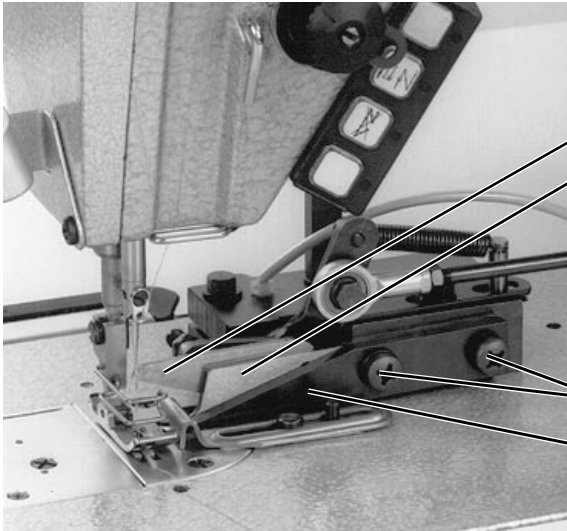


Replacing the lower blade

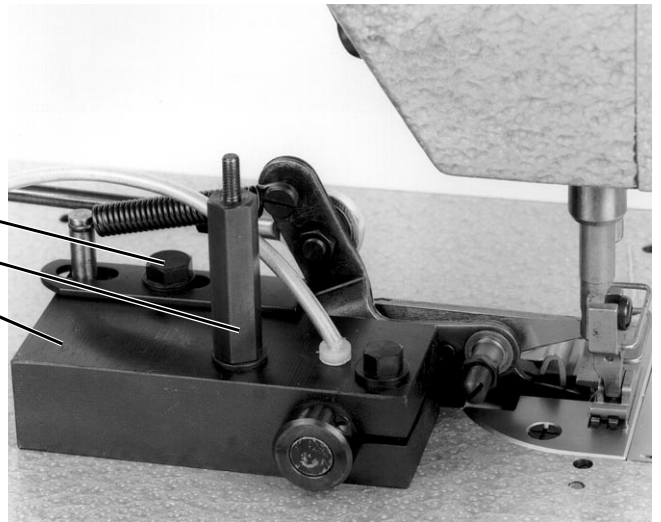
- Remove the slider, foot and needle plate.
- Undo 2 screws 1.
- Remove lower blade 6.
- Sharpen the lower blade.
IMPORTANT
Only the surface marked with the arrow may be sharpened.
- Replace lower blade 6.
The cutting edge must make contact with the upper blade.
- Retighten 2 screws 1.
- Replace the slider, foot and needle plate.



11. Class 271: cross-cutter



1
2
3
4
5
6
7



On sewing machines with this attachment an incision transverse to the direction of sewing can be made in the material at every 6th stitch.

Regulation and inspection

The cross-cutter should cut reliably with the minimum possible pressure.

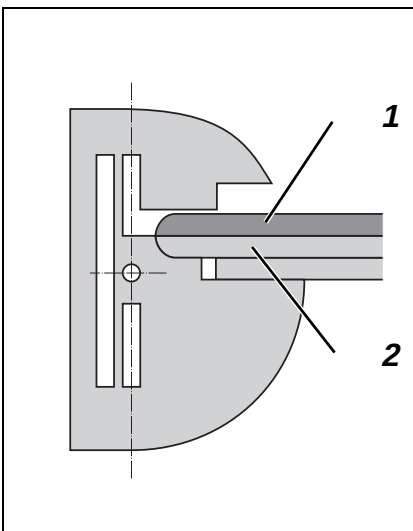


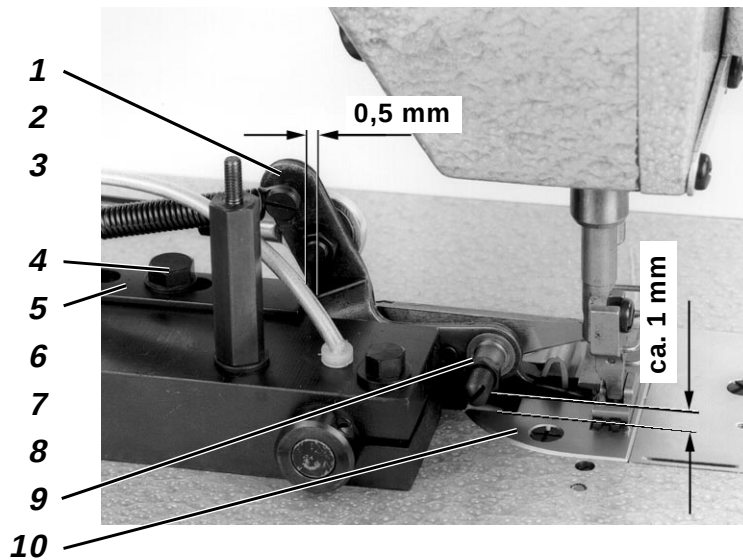
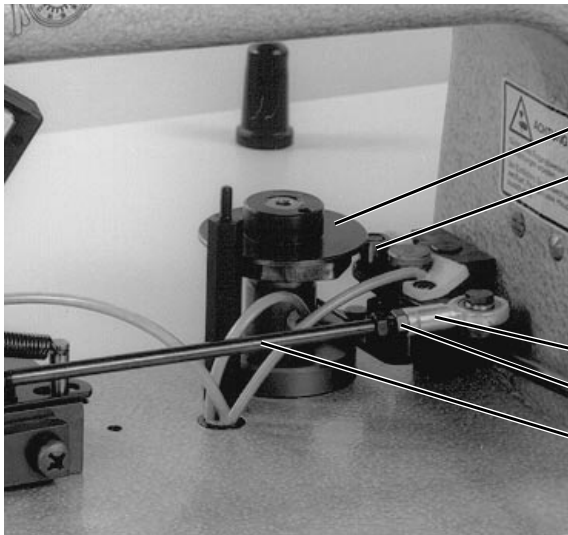
Caution: danger of injury

Turn off the main switch.
The cross-cutter may only be adjusted with the sewing machine switched off.
On completion of the adjustments the cover must be replaced.

Adjusting the cutting depth

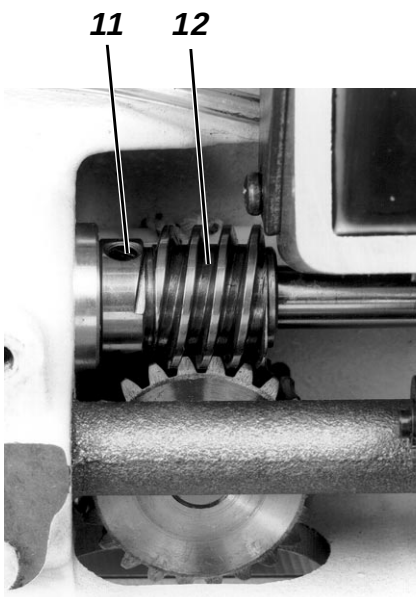
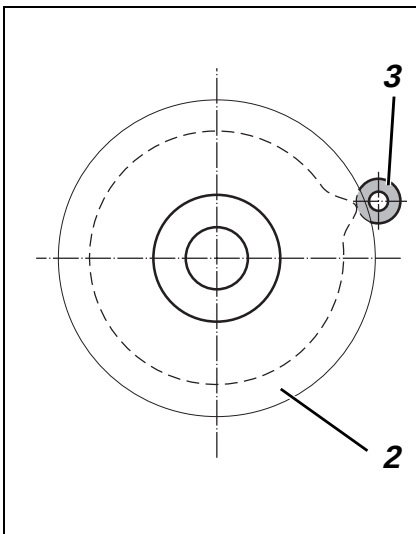
- Undo screws 6.
 - Adjust the thrust piece 7 and counter-blade 2.
The tip of the thrust piece 7 and the tip of the counter-blade 2 should be level with the top of the needle plate.
 - Retighten screws 6.
 - Undo stud bolt 4 and screw 3.
 - Adjust bearing block 5.
The front of the counter-blade 2 should move towards the operator and make contact with the needle plate.
When the cutting movement is carried out the tip of the movable blade 1 should move past the pressure foot and the needle plate at a minimum distance.
After the adjustment has been carried out the back edge of the bearing block 5 must once more be parallel to the back edge of the base plate.
- This adjustment transverse to the feed direction maximises the cutting depth. To reduce the cutting depth the bearing block 5 must be moved to the right.
- Retighten stud bolt 4 and screw 3.





Adjusting the blade lift

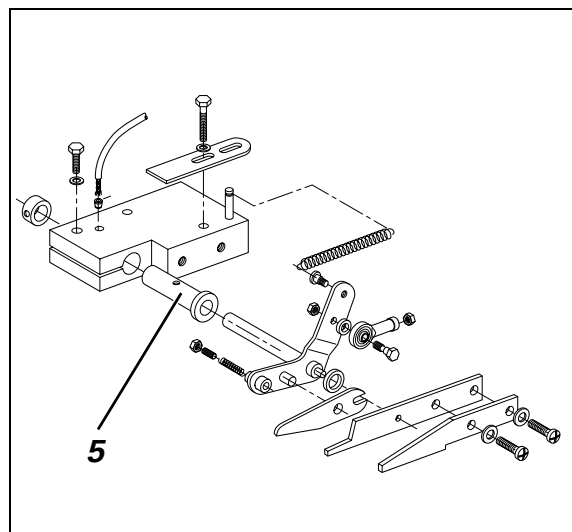
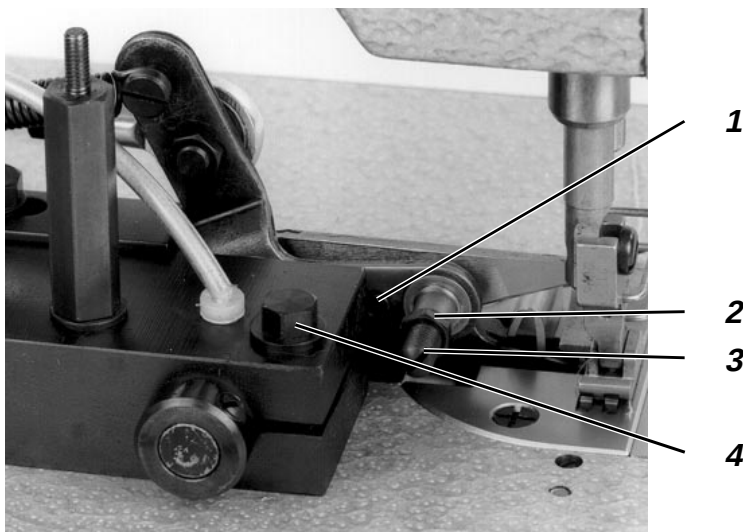
- Move the manual lever to the left.
The cross-cutter is switched on.
- Turn the handwheel.
The roller 3 should be at the highest point of the cam disc 2.
In this position there should be a distance of about 1 mm between the locknut 9 and the cover plate 10.
- Unscrew the toggle link socket 6.
- Undo locknut 7.
- Adjust the distance by lengthening or shortening the connecting rod 8. The toggle link socket must be rotated accordingly.
- IMPORTANT**
The connecting rod 8 must be firmly screwed into the toggle link socket as far as it will go.
- Retighten locknut 7.
- Replace toggle link socket 6.
- Turn the handwheel.
The roller should be completely clear of the cam.
The blade is at its highest position.
- Undo screw 4.
- Adjust stop 5.
Between the stop 5 and the blade lever 1 there should be a distance of 0.5 mm.
- Retighten screw 4.



Adjusting the timing of the blade movement

Depending on the thickness of the material the timing of the cutting movement of the movable blade must be such that the blade does not touch the material until the moment when the feed process has been completed.

- Undo screws 11.
- Turn worm 12.
- Retighten screws 11.



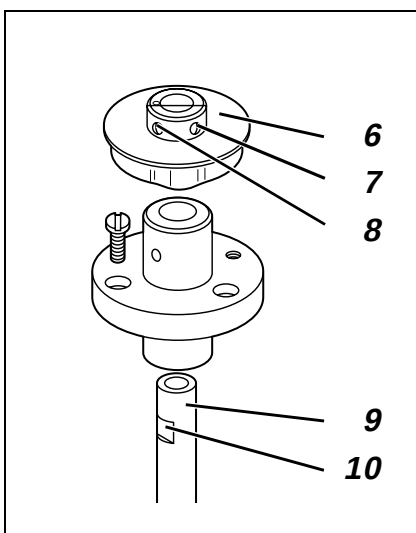
Adjusting the cutting pressure

- Undo screw 4.
 - Adjust bearing bush 5.
The driver pin 1 of the blade lever should make intimate contact with the counter-blade.
 - Retighten screw 4.
 - Undo locknut 2.
 - Adjust the cutting pressure by turning the screw 3.
The blade should cut reliably with the minimum possible pressure.
- IMPORTANT**
Heavy cutting pressure causes excessive blade wear.
- Retighten locknut 2.

Replacing the cam disc

The cross-cutter can be fitted with various cam discs to permit varying distances between the incisions.

order no.:	incision
0219 006305	after every 4th stitch
0219 006301	after every 6th stitch
0219 006307	after every 12th stitch

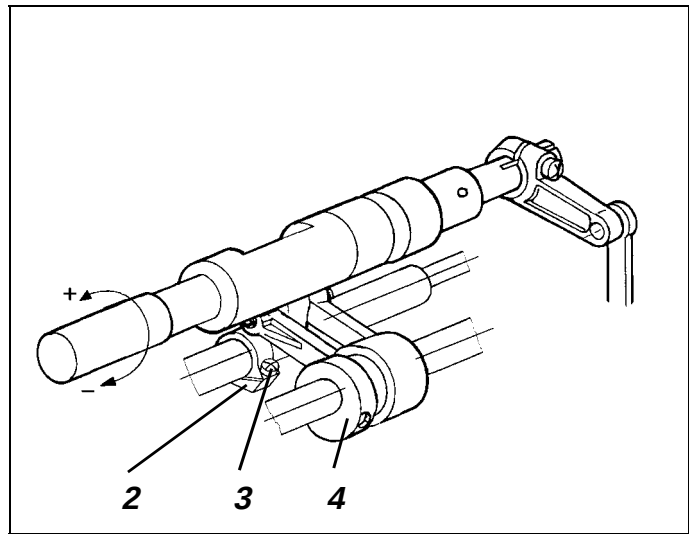
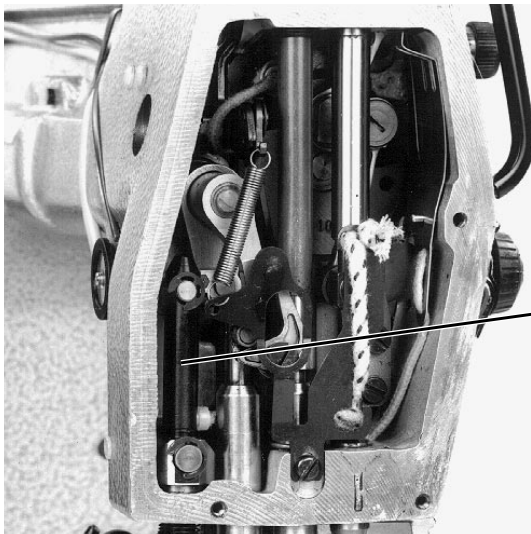


- Move the manual lever to the right.
The cross-cutter is switched off.
- Undo threaded pins 7 and 8 of the cam disc 6.
- Remove cam disc 6 upwards.
- Fit new cam disc onto the shaft 9 as far as the shoulder.
- Tighten threaded pins 7 and 8.
The threaded pin 8 must press on the surface 10 of the shaft.
This ensures that the timing of the blade movement will be correct.



12. Class 275: differential foot overfeed

12.1 Adjusting the overfeed-foot travel



Sewing machines of **class 275** enable an extra layer of material to be processed.

Regulation and inspection

If the sewing machine is in position **B** and a stitch length of 4 mm is set, the overfeed foot must not move when the overfeed guide is swivelled.

If the sewing machine is in position **B** the advance lever 1 should be vertical.



Caution: danger of injury

Turn off the main switch.

The feed may only be adjusted with the sewing machine switched off.

Adjusting the feed

1. Adjusting the thrust cam

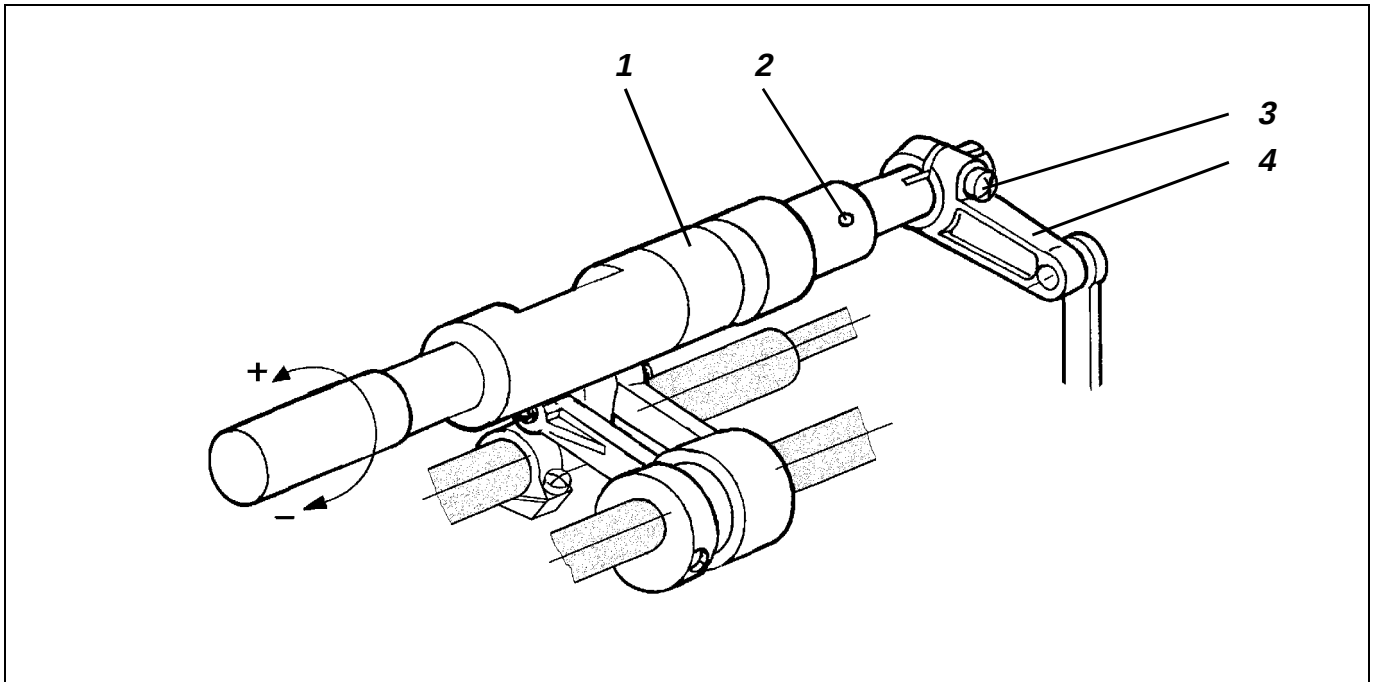
- Set stitch length to 4 mm.
- Remove bobbin-winder cover.
- Lock sewing machine in position **B**.
- Undo 2 screws of thrust cam 4.
- Rotate the thrust cam on the arm shaft.
- Retighten 2 screws of thrust cam 4.

2. Adjusting the advance lever

- Set the stitch length to 4 mm.
- Remove bobbin-winder cover.
- Lock sewing machine in position **B**.
- Undo 2 screws 3 of the locking hub 2.
- Move the advance lever 1 to the vertical.
- Retighten 2 screws 3 of the locking hub 2.



12.1.1 Synchronisation of overfeed foot and feed dog



Regulation and inspection

Set the stitch length to 4 mm for the feed dog **and** the overfeed foot. Turn the sewing machine on with the handwheel. During the overfeed-foot working phase the overfeed foot and feed dog must be synchronised.



Caution: danger of injury

Turn off the main switch. Synchronisation may only be adjusted with the sewing machine switched off.

Adjustment

- Set the stitch length to 4 mm for the feed dog **and** the overfeed foot.
- Remove bobbin-winder cover.
- Undo screw 3 of the clamping lever 4.
- Rotate guide 1 (insert pin in hole 2).

Rotation in the + direction increases the overfeed.

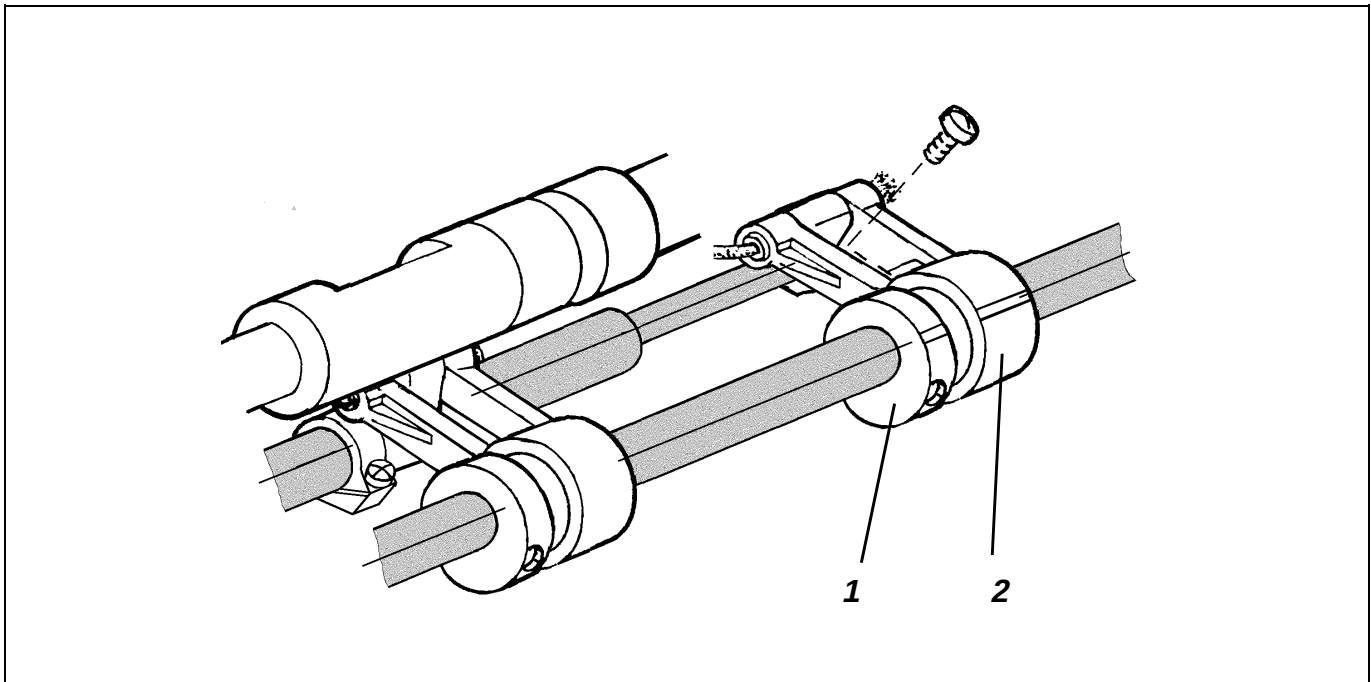
Rotation in the - direction decreases the overfeed.

- Once the overfeed and underfeed are synchronised, retighten screw 3 of the clamping lever 4.



12.2 Adjusting the overfeed-foot lift

12.2.1 Adjusting the overfeed-foot eccentric



Regulation and inspection

In position **E** the lift cam 1 should be aligned groove-to-groove with the connecting rod.



Caution: danger of injury

Turn off the main switch.

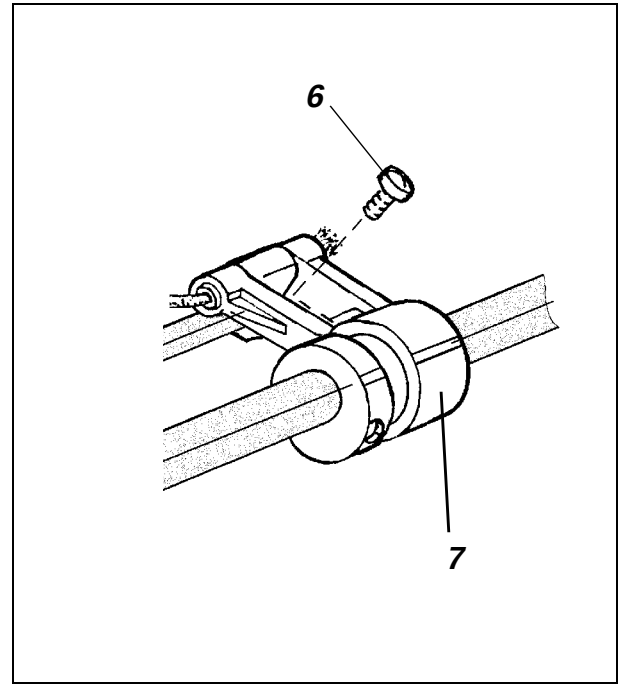
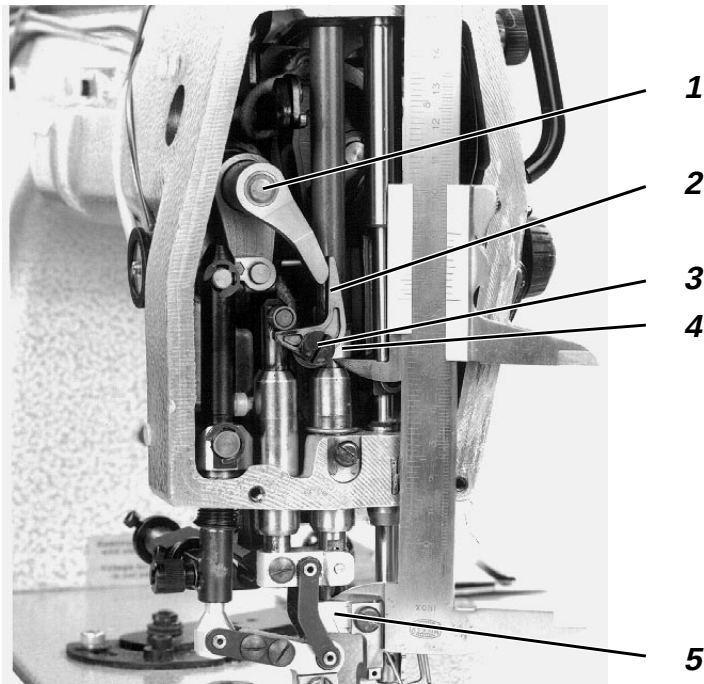
The lift may only be adjusted with the sewing machine switched off.

Adjustment

- Remove bobbin-winder cover.
- Lock sewing machine in position **E**.
- Undo 2 screws of the lift cam 1.
- Turn lift cam 1.
The groove should be in line with the groove of the locking hub 2.
- Retighten 2 screws of the lift cam 1.



12.2.2 Adjusting the overfeed lift height



Regulation and inspection

The overfeed foot has a maximum lift of 2 mm.

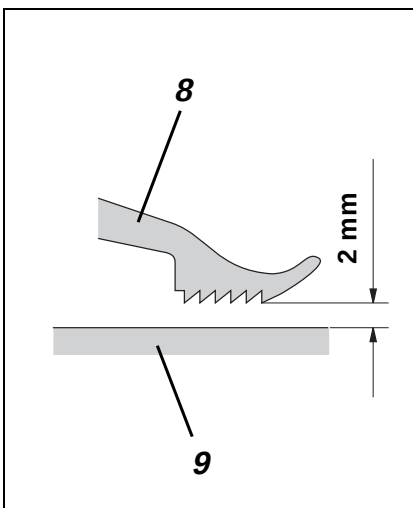
In position **E** the distance between the foot-attachment block 5 and the bearing block 4 of the rocker lever 2 is 71 mm.



Caution: danger of injury

Turn off the main switch.

The lift may only be adjusted with the sewing machine switched off.

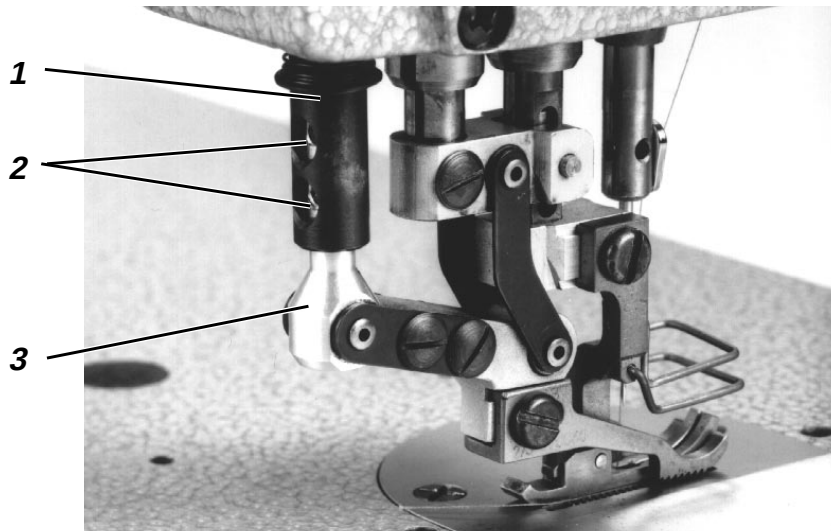


Adjustment

- Remove cover.
- Lock sewing machine in position **E**.
- Undo screw 3.
- Move bearing block 4.
The distance between the foot-attachment block 5 and the bearing block 4 should be 71 mm.
- Note:
The foot-attachment block must be in close contact with the pressure bar.
- Retighten screw 3.
- Undo screw 6 of the locking hub 7.
- Rotate lifting shaft 1.
The overfeed foot 8 should have a maximum lift of 2 mm to the needle plate 9.
- Retighten screw 6.



12.2.3 Position of the overfeed foot



Regulation and inspection

The overfeed foot is adjusted at the factory so that light and medium-weight material is laid on the feed dog in parallel.

The lay (inclination) can be altered to suit the material.



Caution: danger of injury

Turn off the main switch.

The inclination of the overfeed foot may only be adjusted with the sewing machine switched off.

Adjustment

- Undo threaded pins 2.
- Insert the trunnion 3 further into the advance shaft 1 or partly extract it.
This adjusts the inclination of the overfeed foot.
- Retighten threaded pins 2.



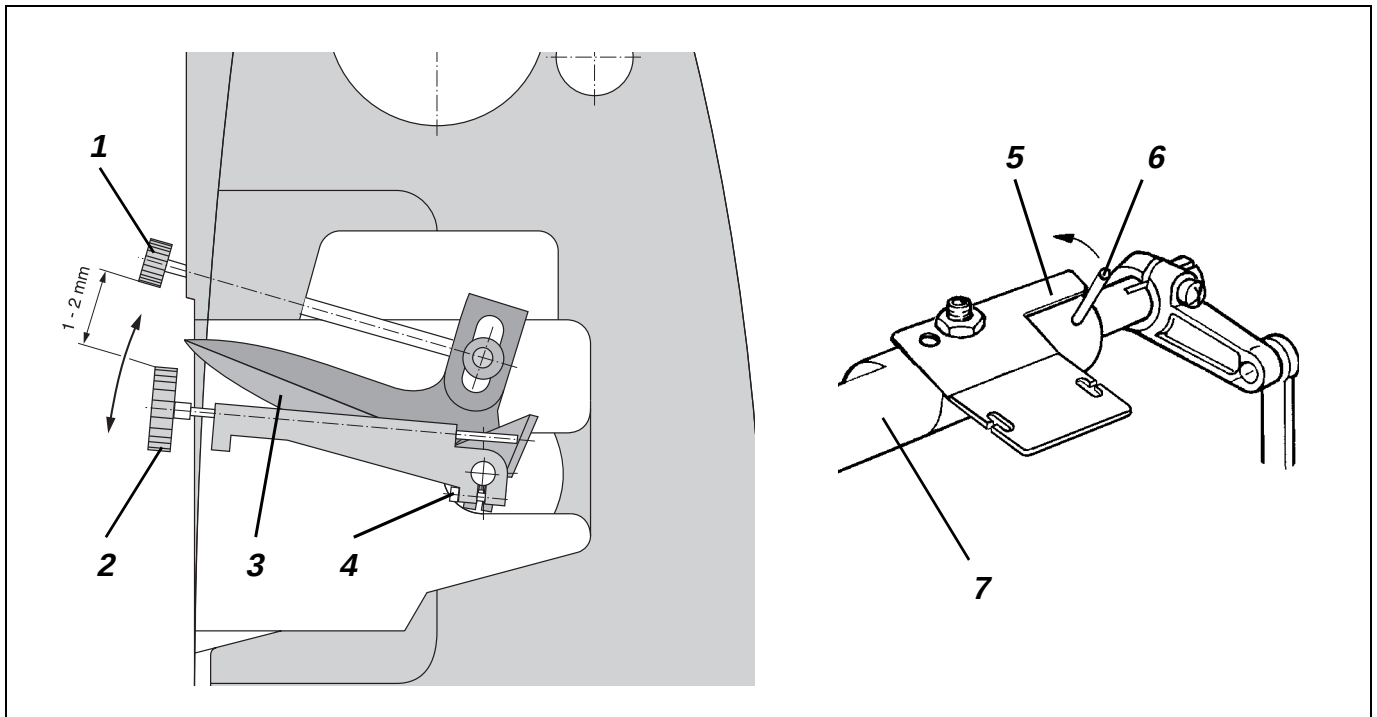
IMPORTANT

After the inclination of the overfeed has been adjusted the lift must be checked and corrected if necessary.

See section 12.2.2.



12.3 Adjusting the extra-thickness operating lever



Regulation and inspection

If the extra-thickness indicator lever 3 has been set to 8 mm by turning the knurled knob 2, the pin 6 should be in the hole of the upper guide 7 on sheet 5.



Caution: danger of injury

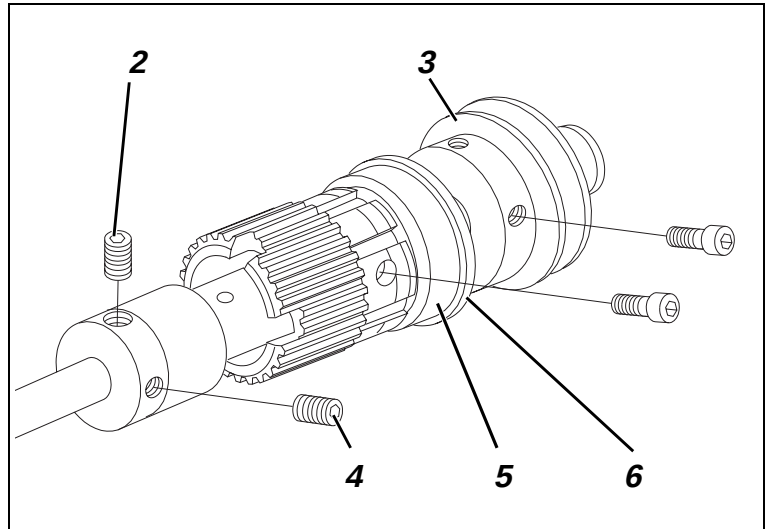
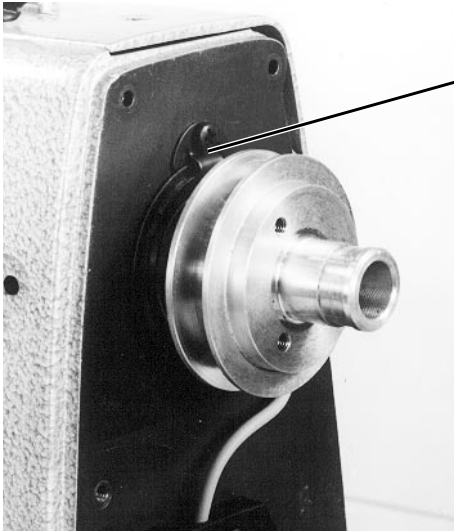
Turn off the main switch.
Adjust the operating lever with the sewing machine switched off.

Adjustment

- Set the adjustable extra-thickness stop 1 to 8 mm.
- Undo locking screw 4 of the operating lever.
Press the extra-thickness indicator lever against the adjustable extra-thickness stop.
- Rotate the knurled knob 2 until there is a distance of 1 to 2 mm to the knurled knob of the adjustable extra-thickness stop.
- Press the upper guide 7 against stop 5 with the pin 6.
- Tighten locking screw 4 of the operating lever.
- Set the extra-thickness indicator lever 3 to 4 mm by turning the knurled knob and check synchronisation with the feed dog (the basic stitch-length must also be set to 4 mm).
- If an adjustment is necessary, proceed as in section 12.1.1.



13. Replacing the arm-shaft bearing



Regulation and inspection

The right-hand arm-shaft bearing must be replaced if the arm shaft is running stiffly.



Caution: danger of injury

Turn off the main switch.

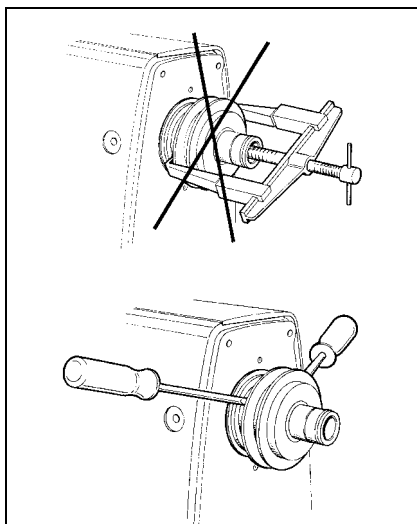
Replace the arm-shaft bearing with the sewing machine switched off.



IMPORTANT

Do not use an extractor tool

When the right-hand arm-shaft bearing is removed and replaced no axial pressure must be exerted on the arm shaft. Axial pressure in the direction of the cover will damage the thread lever.



Replacing the arm-shaft bearing

- Remove the position sensor, handwheel, belt protector and cover.
- Remove the V-belt and 2 retaining springs 1.
- Remove retaining ring 6.
- Undo screws 2 and 4.
- Push the synchronous belt off the upper synchronous-belt pulley to the left.
- Prise off the drive unit with 2 screwdrivers or similar.
The drive unit consists of: synchronous-belt pulley, V-belt pulley and ball-race.
- Remove V-belt pulley 3.
- Remove the synchronous-belt pulley and replace it completely (order no.: 0271 000322), or remove the ball-race 5 with an extraction device and press on a new ball-race (order no.: 0211 000362).
- Replace V-belt pulley.
- Replace drive unit.
- Replace the parts which have been removed.



IMPORTANT

The sewing machine must be re-adjusted after the arm-shaft bearing has been replaced.



14. Lubrication



Regulation and inspection

The oil level must not fall below the "minimum" mark.



Caution: danger of injury

Turn off the main switch.

Work on the oil-circulation system may only be carried out with the sewing machine switched off.

Oil can cause skin rashes.

Avoid protracted contact with the skin.

In the event of contact, thoroughly wash the affected area.



IMPORTANT

The handling and disposal of mineral oils is subject to legal regulations.

Used oil must be delivered to an authorised acceptance point.

Protect the environment.

Take care that no oil is spilled.

Adjustment

- Top up the oil reservoir 1 to the "maximum" mark.

- For shuttle lubrication see section 13.2 -

The oil reservoir should be topped up only with **ESSO SP-NK 10** lubricating oil or an equivalent oil with the following specification:

viscosity at 40° C: 10 mm²/s
flashpoint: 150° C

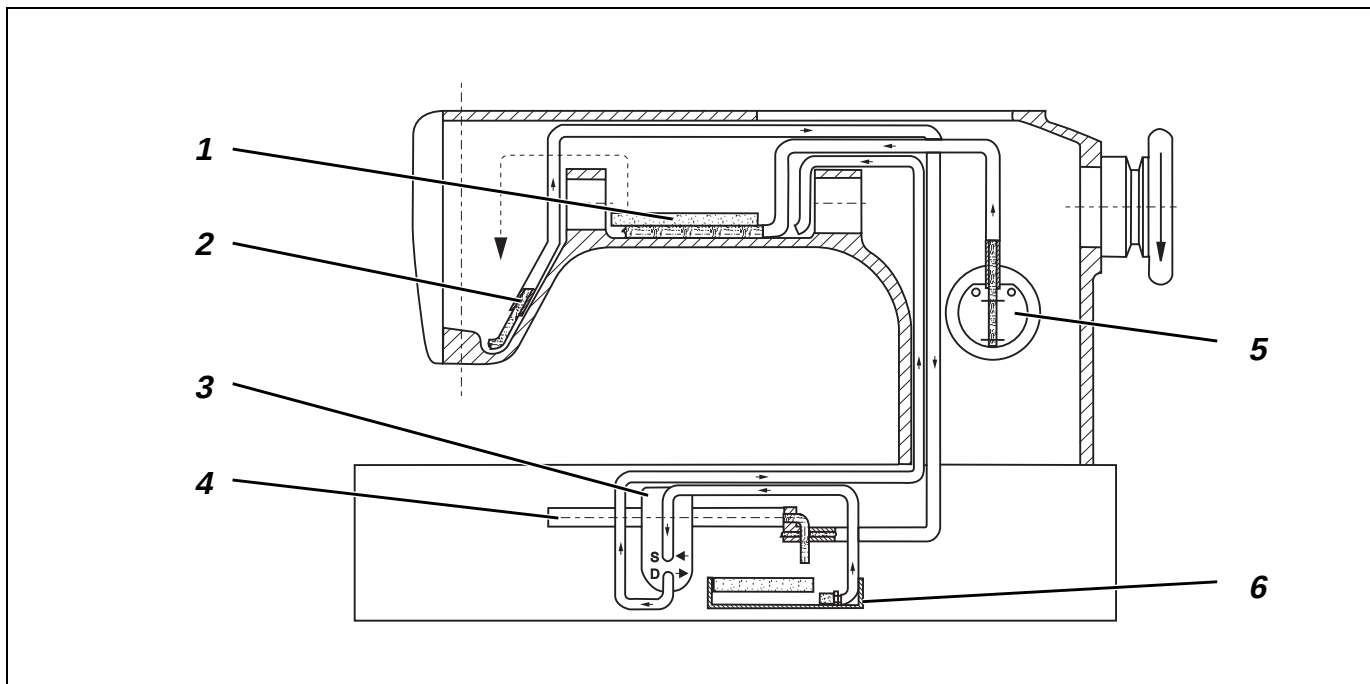
ESSO SP-NK 10 can be obtained from **DÜRKOPP-ADLER AG** sales outlets under the following parts nos.:

2-litre container: 9047 000013

5-litre container: 9047 000014



14.1 Oil circulation



The oil passes from the oil reservoir 5 to the sump 1, from where the lubrications points in the arm and sewing-head regions are supplied with oil.

The oil thrown off by the crank mechanism passes along the wick 2 to the central distributor pipe 4 for the lubrication points located under the base plate. Excess oil drips into the oil-collection tray 6 and is returned to the sump 1 by the pump 3.

This provides effective lubrication with minimum oil consumption.



Caution: danger of injury

Turn off the main switch.

Work on the oil-circulation system may only be carried out with the sewing machine switched off.



IMPORTANT

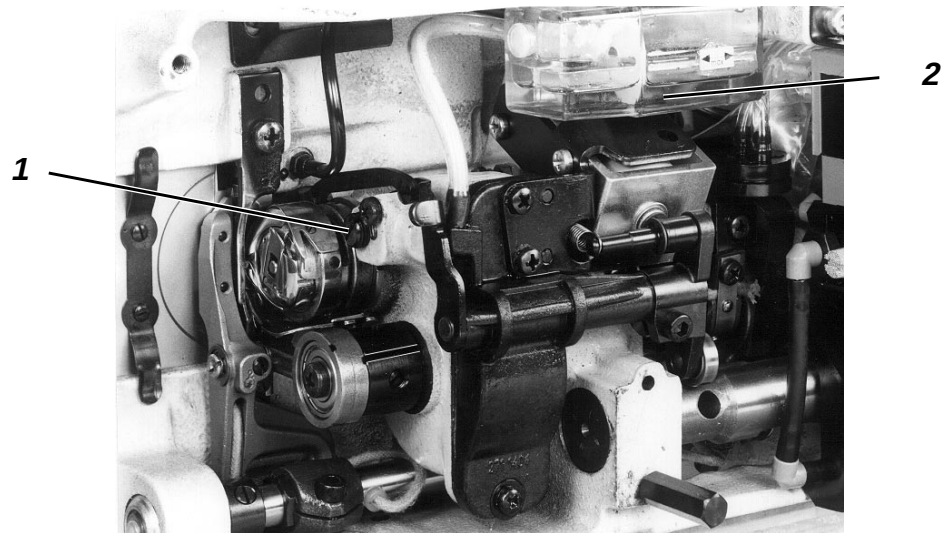
After work is completed it is essential to ensure that the hoses are correctly reconnected to the pump.

S = suction

D = pressure



14.2 Shuttle lubrication



Caution: danger of injury

If shuttle lubrication is checked with the sewing machine switched on, the utmost care must be taken.

Turn off the main switch.

Shuttle lubrication may only be adjusted with the sewing machine switched off.

Regulation and inspection

The oil quantity required for shuttle lubrication varies with the sewing yarns and material to be processed.

A piece of paper - ideally blotting paper - held beneath the shuttle should be lightly sprayed with oil when a seam about 1 m long is sewn at full speed using the intended threads and material.

Adjustment

- Adjust screw 1:

anti-clockwise	= more oil
clockwise	= less oil

2 = shuttle-lubrication oil reservoir



15. Control and operating panel

15.1 Control and QUICK operating panel

In this service manual only the most important aspects of the control system are described.

A detailed description (parameter list and description) can be found in the motor manufacturer's detailed operating manual.

15.1.1 Changing settings



To ensure that the settings are not inadvertently altered they can only be changed by gaining access to the technician level.

Access to the technician level

G **-**

- Turn off the main switch.
- Simultaneously press the "G" and "-" keys and hold them down.
- Turn on the main switch and release both keys.

G **-**

- "★" appears in the display.
- Hold down the "G" key and press "-".
- "INPUT" appears in the display.
- The technician-level settings can now be changed.
- The drive is inoperative.

Changing settings

G

- Press the "G" key.
- The group is selected.

F

- Press the "F" key.
- The setting is selected.

+

- Press the "+" key.
- The selected value is increased.

-

- Press the "-" key.
- The selected value is decreased.

G **-**

- Hold down the "G" key and press the "-" key.
- "★MANUAL" appears in the display.
- The drive is again operative.



15.1.2 RESET

RESET restores all settings to their factory-set values.



- Turn off the main switch.
- Push the pedal fully forwards (step 12).
- Simultaneously press and hold down the "**G**", "**F**", "**+**" and "**-**" keys on the control field.
- Turn on the main switch.
"**RESET +/-**" appears in the display.
- Press the "**+**" key.
All settings are restored to their factory-set values.



IMPORTANT

The "**700**" setting - position-sensor reference point - is not reset.
The "**702**" and "**703**" settings must be checked and corrected if necessary.



15.2 Control and EFKA operating panel

In this service manual only the most important aspects of the control system are described.

A detailed description (parameter list and description) can be found in the motor manufacturer's detailed operating manual.

15.2.1 Changing settings



To ensure that the settings are not inadvertently altered they can only be changed on gaining access to the technician level.

1. Selecting adjustment mode

P

- Turn off the main switch.
- Press and hold down the "P" key.
- Turn on the main switch.
"C-0000" appears in the display.
- Release the "P" key.
The first digit of the code number flashes.

2. Changing to technician level

1 9 0 7

E

- Enter code number "1907" with the number keys "0..9".
- Press the "E" key.
The control unit switches to technician level.
The first parameter ("F-100") appears in the display.
The technician-level parameters can now be changed.

If an incorrect code number is entered the text
"C-0000 InFo F1" appears. The entry must be repeated.

3. Selecting the desired parameters

0 ... **9**

E

- Press the number keys "0..9".
The parameter no. is selected.
- Press the "E" key.
The selected parameter number (e.g. "F-100") appears in the first line. The brief designation of the parameter and its value (e.g. "SSc 020") appear in the second line.

If an incorrect parameter number is entered the text
"F-XXX InFo F1" appears. The entry must be repeated.



4. Changing the displayed parameter value



- Press the "+" key.
The parameter value is increased or switched on.



- Press the "-" key.
The parameter value is decreased or switched off.

5. Saving a changed parameter value



- Press the "E" key.
The changed parameter value is saved.
The next technician-level parameter appears in the display.
Repeatedly pressing the "E" key successively displays all technician-level parameters
or



- Press the "P" key.
The changed parameter is saved.
Select a new parameter as described under point 3.

6. Leaving programming mode



- Press the "P" key twice.
Programming is terminated.



IMPORTANT

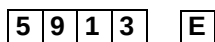
The changed parameter values are not saved until a seam is begun by depressing the pedal.
If the sewing machine is switched off immediately after programming without sewing, then **none** of the changed parameter values is saved.

15.2.2 RESET

RESET restores all settings to their factory-set values.



- Turn off the main switch.
- Press and hold down the "P" key.
- Turn on the main switch.
"C-0000" appears in the display.



- Enter the code number "5913" with the number keys and press the "E" key.
"F-400" appears in the display. The "4" digit flashes.



- Press the "E" key.
"F-400" and "rst 093" appear in the display.



- Press the "+" key.
"F-400" and "rst 094" appear in the display.



- Press the "E" key.
The same text appears in the display as when the sewing machine is switched on.
The parameters are restored to their factory settings.



IMPORTANT

Certain parameters such as "F-170" (reference position), "F-171" (needle position) and "F-161" (direction of motor rotation) are not restored by a **RESET**.

The specially-set parameter values (among them motor-speed settings) must be checked and corrected if necessary.



16. Maintenance



Caution: danger of injury

Turn off the main switch.
Maintenance may only be carried out with the sewing machine switched off.

The maintenance work to be carried out daily or weekly by the sewing machine's operating personnel (cleaning and lubrication) is described in part 1: Operating manual. It is given in the following table for the sake of completeness.

Work to be carried out	operating hours			
	8	40	160	500
upper part				
clean up dust and lint in the area beneath the needle plate	X			
remove dust and lint from between the feed-dog elements (remove the needle plate)	X			
clean up dust and lint in the area beneath the bobbin brake spring	X			
check oil level in reservoir		X		
check oil level in shuttle-lubrication reservoir		X		
check shuttle lubrication			X	
inspect synchronous belt				X
sewing drive				
remove dust and lint from motor-fan grille	X			
inspect condition and tension of V-belt		X		
Pneumatic system				
check water level in the pressure regulator	X			
clean filter insert in maintenance unit				X
check system impermeability				X



IMPORTANT

The oil should be changed after the first 500 operating hours.
Thereafter it should be changed every 2 years regardless of the number of operating hours.



17. Summary of all sewing-machine settings



IMPORTANT

Adjustments to the sewing machine must be carried out in the order given.

no.:	subject	section	correct adjustment	correction
adjusting disc				
1	position on the arm shaft	1.3	In position A it must be possible to insert a pin in the crank groove.	Rotate synchronous-belt pulley.
feed				
2	null point	2.1	The adjusting wheels must make no movement during the feed process.	Rotate guide.
3	thrust cam	2.2	No advance movement at maximum stitch length when the stitch-length regulator is moved.	Rotate thrust cam.
4	lift cam	2.3	Markings on lift cam and connecting rod in line.	Rotate lift cam.
5	feed-dog height	2.3	At its highest position the feed dog protrudes from the needle plate by: 0.9 mm for the fine-toothed feed dog 1.1 mm for the coarse-toothed feed dog	Rotate eccentric bolt.
6	eccentric bush	2.3.1	Position of feed dog with respect to needle plate (depends on the material).	Rotate eccentric bush.
7	Synchronisation of needle and underfeed.	2.4	Needle feed and underfeed set to be equal.	Turn eccentric bolt on underfeed.
8	Distance of needle bar and pressure bar	2.5	At stitch length "0": 9 mm.	Swivel needle-bar guide.
9	Align feed dog	2.6	needle in centre of needle hole.	Align feed dog.
class 273/274: roller overfeed				
10	feed length	2.7	Maximum feed length: 7 mm.	Remove threaded pin.
11	raising and lowering function		See section 12 of the setting-up instructions.	Adjust parameters.
12	synchronisation	2.7.1	Groove of cam and connecting rod in line.	Rotate cam.
13	distance from feedroller to needle	2.7.2	distance between centre of roller and centre of needle: 28.5 mm or 30 mm.	Rotate roller overfeed.
14	lift	2.7.3	Upper end position: the feed roller must not touch the sewing foot. Lower end position: after being fitted the link must encounter elastic resistance at about the 1-mm point.	Adjust threaded pin. Adjust threaded pin.
15	roller pressure	2.7.4	depending on the material	Move cylinder.
16	fabric deflector	2.7.5	So tight against the roller that the roller can only just rotate freely.	Move fabric deflector.



no.:	subject	section	correct adjustment	correction
foot height and foot lift				
17	pressure bar	3.1	class 271/273: distance of 0.5 mm between block and traction bracket if the sole of the foot is in contact with the needle plate. class 272/274: distance of 0.5 mm between block and bush if the sole of the foot is in contact with the needle plate.	Move pressure bar.
18	hinged foot	3.4	slight pressure on the material	Adjust torsion spring.
upper-thread tensioner				
19	upper-thread tensioner release	4.	play of 0.3 mm with upper-thread tensioner closed	Move magnet.
20	thread take-up spring	4.1	spring travel: keep upper thread under tension until the tip of the needle has entered the material. spring tension: about 20 to 50 cN	Rotate bush. Adjust tension bolt.
needle-bar height				
21	needle-bar height	6.	Set with gauge.	Move needle bar.
shuttle adjustments				
22	shuttle-drive housing	7.2	distance between shuttle and adjusting ring: 0.4 mm distance between needle-plate surface and thread-drawing plate: small shuttle: 3.7 mm large shuttle: 3.3 mm	Adjust housing laterally. Adjust stop screw in base plate.
23	loop lift	7.1	In position A shuttle beak at centre of needle and distance from shuttle beak to furrow: 0.1 mm	Adjust shuttle.
24	bobbin-housing holder	7.3	distance of retaining tab and housing: 0.6 ± 0.1 mm	bend retaining tab
thread clipper				
25	control cam	8.1	In non-operated state 0.2 to 0.3 mm between control cam and ball-race. In position D : the ball-race must engage in the control-cam indentation.	Move magnet. Turn control cam.
26	fixed blade	8.2	blade must make contact with the screw	Move blade.
27	thread-guide plate or adjusting plate	8.4	Must make contact with the screw. 0.5 mm between thread-guide plate and thread-drawing plate, 0.3 mm between thread-guide plate and hooked blade.	Align thread-guide plate or adjusting plate.
28	hooked blade	8.5	Must make contact with the screw. In at-rest position: tip of hooked blade and cutting edge of the fixed blade at same level. During the blade movement: tip of the hooked blade and triangle coincide in the thread-guide plate.	Move or align hooked blade.
29	cutting pressure	8.6	Cut reliably at minimum pressure.	Adjust cutting-pressure screws.



no.:	subject	section	correct adjustment	correction
class 271/272: thread retractor				
30	thread retractor	9.	Lever should make contact with the disc. Retraction movement should take place without hindrance	Adjust magnet. Adjust wire.
class 272: edge cutter				
31	position of the blade in direction of sewing	10.	Adjust start of cut.	Move blade holder.
32	position	10.	Upper blade parallel to lower blade.	Adjust block.
33	blade-height position	10.	Edge at same level as lower blade.	Adjust blade bar.
34	pressure	10.	Move upper blade against lower blade.	Adjust threaded pin.
35	indicator bracket	10.1	Tip of the bracket at start of cut.	Move bracket.
class 271: cross-cutter:				
36	cutting depth	11.	Front of counter-blade on needle plate. Back edge parallel to base plate.	Adjust bearing block.
37	blade lift	11.	Reliably cut material.	Adjust connecting rod.
38	blade-movement timing	11.	Cutting movement when the feed process is complete.	Turn worm.
39	cutting pressure	11.	Cut reliably at minimum pressure.	Adjust cutting-pressure screw.
class 275: Differential foot-overfeed				
40	advance adjustment	12.1	In position B no movement when overfeed guide is swivelled.	Rotate thrust cam.
41	position of advance lever	12.1	In position B the advance lever must be vertical.	Rotate advance lever.
42	Synchronisation overfeed foot - feed dog.	12.1.1	Synchronisation between overfeed foot and feed dog.	Rotate guide.
43	lift adjustment	12.2.1	Lift cam and thrust cam groove-to-groove.	Rotate lift cam.
44	lift	12.2.2	In position E 71 mm between foot-attachment block and bearing block.	Move bearing block.
45	maximum lift 2 mm	12.2.2	Position of lifting shaft.	Rotate lifting shaft.
46	position of overfeed foot	12.2.3	parallel to needle plate	Move trunnion in advance shaft.
47	operating lever for extra thickness	12.3	Pin should be in contact with stop with extra thickness set to 8 mm.	Rotate upper guide.